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GLACIERS OF PRINCE WILLIAM SOUND
AND THE SOUTHERN PART OF THE
KENAI PENINSULA, ALASKA

IV.—GLACIERS OF THE SOUTHERN COAST OF THE
KENAI PENINSULA*

BY

U. S. GRANT AND D. F. HIGGINS

Much of the southern coast of the Kenai Peninsula, from Cape Puget at the western entrance to Prince William Sound to Port Chatham near the southwestern extremity of the peninsula, has been seldom visited and its glaciers are little known except for their approximate locations on the small scale charts of this region and for brief descriptions.† (Fig. 1.) In the summer of 1909 the writers studied this region and made a reconnaissance map of the coast line. All of the glaciers which reach tide water, or approach close to it, were seen and photographs were taken of many of these ice streams. Some of the photographs are here reproduced; these and others are preserved in the collection of the United States Geological Survey.

The southern coast of the Kenai Peninsula is deeply indented by bays which have mountainous shores, and snow-covered peaks are frequently in view near the heads of these bays. From this mountain area, the backbone of the Kenai Peninsula, glaciers extend

* Published with the permission of the Director of the United States Geological Survey.

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† Davidson, George. The glaciers of Alaska that are shown on Russian charts or mentioned in older narratives. *Trans. and Proc. Geog. Soc. of the Pacific*, series 2, vol. 3, 1904, pp. 1-98.

southward and southeastward towards the Pacific. Some of these ice streams, as the Bear, Northwestern and McCarty glaciers, are of large size and reach tide water. These glaciers and their surroundings form scenes of beauty and grandeur which deserve to be much better known than they are at present. Back from the shore line little exploration has been done and there are large areas which have not been visited even by prospectors. Ice fields of unknown but considerable extent exist within 5 to 20 miles of the coast line.

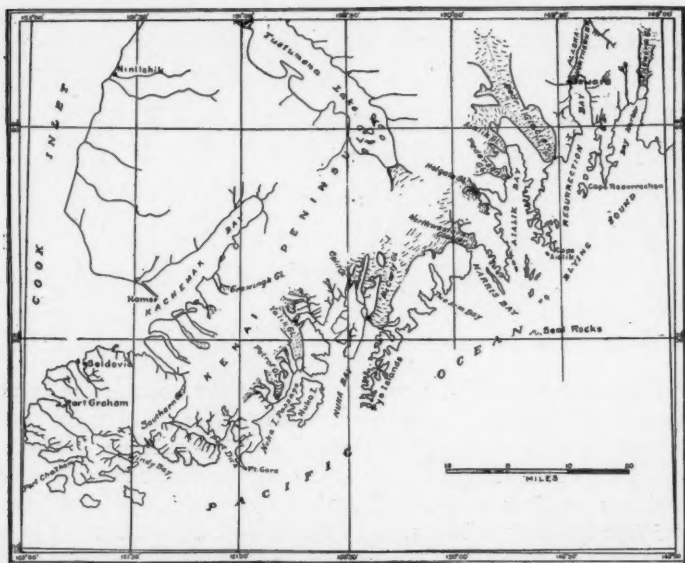


FIG. 1.—Map of the southern part of the Kenai Peninsula, showing the coastal glaciers.

One of the most extensive of these,—possibly consisting of two or more separate parts,—occupies the elevated district included between Tustumena Lake and Resurrection, Aialik and Nuka bays. Another large ice field exists between Nuka Bay and Kachemak Bay of Cook Inlet and sends glaciers downward both to the southeast and the northwest.

CAPE PUGET TO CAPE RESURRECTION

Between Prince William Sound and Resurrection Bay, or more strictly between Capes Puget and Resurrection, there are at least four marked indentations of the shore line and valleys opening into these bays. Each of these valleys contains a glacier which from

east to west are the Puget, the Excelsior, an unnamed glacier, and the Ellsworth. This coast lacks good harbors which are not exposed to the southerly winds and has consequently been little visited, except for Day Harbor, and not carefully mapped.

PUGET GLACIER

The Puget Glacier, a name we apply to it from the adjacent cape and bay, ends about a mile and a quarter from the head of Puget Bay. (Fig. 2.) This glacier is shown on Tebenkof's map* (1852) and probably also on Vancouver's map, though it is omitted from recent U. S. Coast and Geodetic Survey charts (Nos. 8502 and 8550).

The surface of the upper part of the Puget Glacier is smooth, but about a mile and a half from its end the glacier narrows and for half a mile its surface is steep and much crevassed. It then widens and becomes smooth again, but near its end passes over a cliff, and

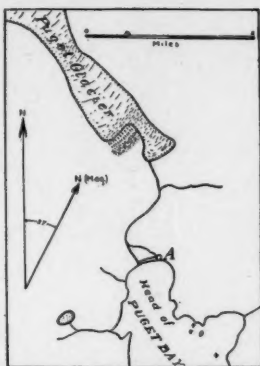


FIG. 2.—Map of Puget Glacier, sketched from the head of Puget Bay, July 11, 1909.



FIG. 3.—Puget Glacier from Point A of Fig. 2, July 11, 1909.

* Davidson, George, *op. cit.*, p. 20, map 5.

the western side of the glacier ends on the top of this cliff in an ice wall estimated to be 200 feet in height. From this wall blocks of ice fall over the cliff and probably do not consolidate again, although this fact was not conclusively shown from our point of view. The eastern part of the ice stream comes over this cliff in a much crevassed condition and then becomes smoother and deploys towards its end. (Fig. 3.) Beyond the end of the glacier is a considerable bare zone, between which and the sea is a mature forest. The bare zone appears to have been recently occupied by the glacier.

EXCELSIOR GLACIER

The Excelsior Glacier is shown on the earlier maps.* We passed within two miles of the glacier on July 11, 1909. Its front appears to be within half a mile of the sea.

On the east is a very large bare zone between the ice and the forest, and on the west there is also a bare zone, but this is not so clearly seen. The glacier ends on a low gravel flat, the central part of which is bare of vegetation. From the appearance of these bare zones it seems that the Excelsior Glacier was considerably larger within a few years and its front may then have reached the sea.

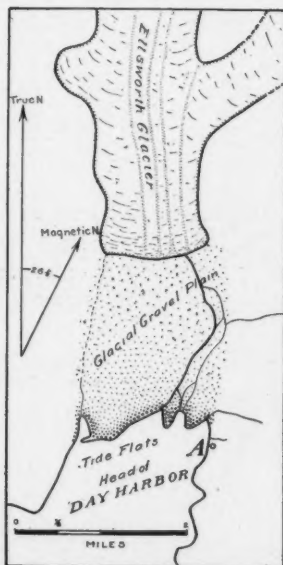


FIG. 4.—Map of Ellsworth Glacier, sketched from the head of Day Harbor, July 12, 1909.

ELLSWORTH GLACIER

The Ellsworth Glacier is situated at the head of Day Harbor, the first bay east of Resurrection Bay. This glacier is not mentioned by Davidson† and evidently did not appear on the maps of Tebenkof and Vancouver. It is shown as reaching tide water on U. S. Coast and Geodetic Chart No. 8502 (1907).

The Ellsworth Glacier (Figs. 4 and 5) is an ice stream of considerable length and low slope. It ends about a mile and three-quarters from tide water. The eastern part of the front is much covered with débris, and the glacier carries four well-marked medial moraines. There are two feeders coming in from the east. About

* Davidson, George, *op. cit.*, p. 20, map 5.

† Davidson, George, *op. cit.*

opposite the upper feeder there is a nunatak which does not rise much above the surface of the ice, and a little south of this feeder and farther west than the other is another nunatak of small size which rises very little above the ice surface. On the west side of the front of the glacier is a bare zone perhaps 200 feet in height, and on the east side of the front is a morainic deposit also bare of vegetation. There are also some morainic hillocks in front of the glacier, and part of the outwash plain is covered by vegetation. We did not

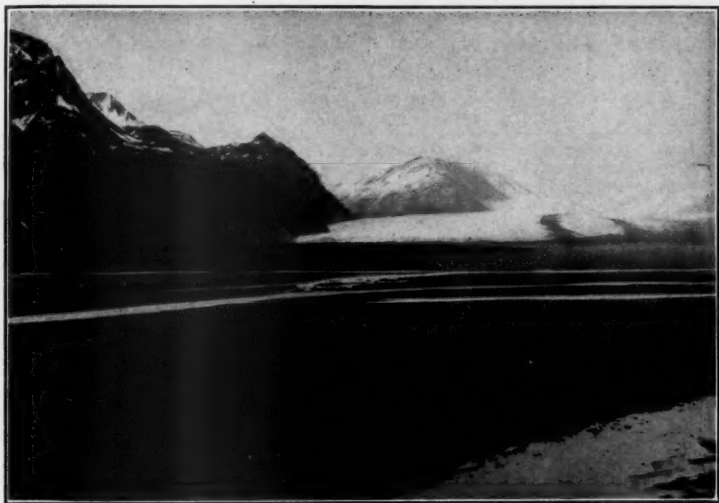


FIG. 5—Ellsworth Glacier from Point A of Fig. 4, July 12, 1909.

visit the front of the glacier and so have no information as to recent retreat or advance except for the bare zone noted above. It is very improbable that this glacier has reached tide water within a century.

RESURRECTION BAY

Resurrection Bay is the most northerly extending indentation of the coast line of the Gulf of Alaska between Prince William Sound and Cook Inlet. At the head of this bay is the town of Seward, the terminus of the Alaska Northern Railroad and an outfitting point for the gold districts to the north. Seward has a most excellent location on an alluvial fan formed by a stream which comes from the mountains to the west. To the east of the town is the Godwin Glacier, which does not reach sea level; and farther south, on the

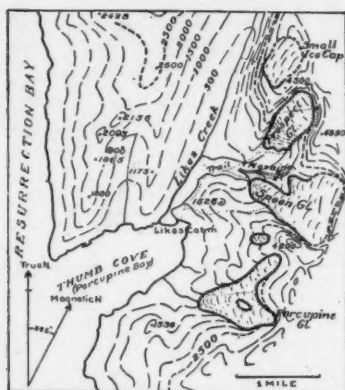


FIG. 6—Sketch map of glaciers east of Thumb Cove, Resurrection Bay, August 21, 1908. Shore line and elevations from U. S. Coast and Geodetic Survey; contour interval 500 feet.

narrow neck of land which separates Resurrection Bay from Day Harbor, are a few small glaciers. The most attractive of these are near the head of Thumb Cove, the largest of the small bays on the east side of Resurrection Bay. These glaciers are shown in the accompanying illustrations (Figs. 6 and 7) and they with the rugged mountain peaks about them form a most picturesque and beautiful scene.

BEAR GLACIER

On the west side of Resurrection Bay, thirteen miles from Seward, is the Bear Glacier, which is the largest ice stream to reach the sea on the Kenai Peninsula. (Figs. 8 and 9.) This glacier is shown on Chart No. 8538 of the United States Coast and Geodetic Survey, and the position of the glacial front in 1909 was essentially the same as when that chart was made (1905). The Bear Glacier has a comparatively low slope and carries two large medial moraines. The gravel flat on which the glacier rests is covered in part by the highest tides, and apparently a combination of highest tide and

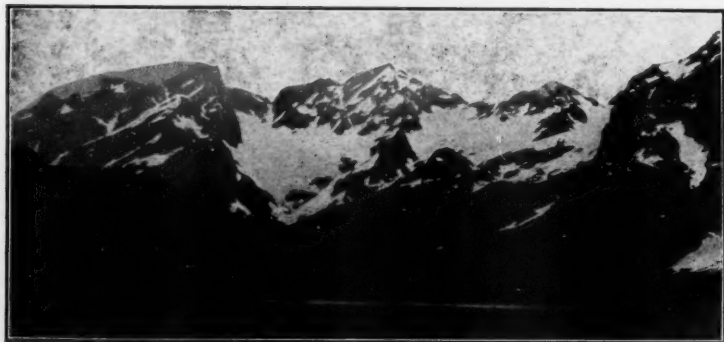


FIG. 7—Glaciers east of Thumb Cove, Resurrection Bay, August 21, 1908. At the left is the small ice cap shown in Fig. 6, and to the right of this ice cap are the Prospect, Spoon and Porcupine glaciers. The three peaks in the central half of the photograph are (from left to right) 4,500, 4,350 and 4,200 feet respectively above sea level.

strong southerly wind brings waves over most of this flat. Along the center of the ice front ordinary high tide reaches the glacier. On the east side of the flat is a gravel terrace covered with grass and a few bushes; the terrace at its south end is at high tide level and ascends about 30 feet in going northward a mile. A small rem-

nant of apparently the same terrace occurs on the western part of the glacial flat. The terrace probably represents the aggraded surface of the outwash plain when the glacial front stood farther back than at present. On the northeast of the glacial front is a bare rock face about 200 feet high, evidently recently glaciated. South of this is a rocky island in the glacial flat. The northwestern side of the island is bare of timber, and its southeastern side has

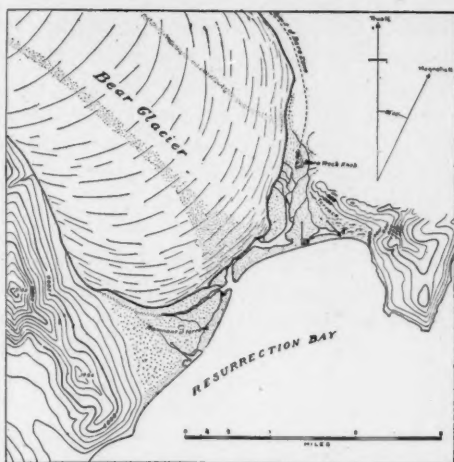


FIG. 8.—Map of front of Bear Glacier, July 20 and 21, 1909. Occupied points indicated by circles; arrows show directions in which photographs were taken; contour interval 200 feet.



FIG. 9.—East side of front of the Bear Glacier, from Point A of Fig. 8, July 20, 1909. The terrace is shown at the foot of the hill on the right.

timber. On the west side of the glacier front is a bare zone about 200 feet high and extending a quarter of a mile beyond the ice front. The glacier front thus has been somewhat (perhaps a quarter of a mile) in advance of its present position in comparatively recent years, but has not been farther advanced than the above since the growth of the present forest.

AIALIK BAY

Aialik Bay lies just west of Resurrection Bay. Parts of both sides of the former bay are very irregular, being indented by many approximately semi-circular coves. These represent old glacial cirques which have been drowned in the sea. Towards the upper part of the bay the cirques lie above sea level and near the head of the bay some of these cirques are now occupied by small glaciers. These drowned cirques are also found to the east on Resurrection Bay and to the southwest on Harris Bay and the Pye Islands. (See Fig. 14.)

AIALIK GLACIER

The Aialik Glacier reaches tide water at the west side of the extreme head of Aialik Bay (Fig. 10), whence the name of the glacier. The glacial front is a cliff estimated to be 200 feet in height, and from this cliff ice is being discharged rapidly. There is no medial moraine on the Aialik Glacier, and the lateral moraines, especially the one on the northeast side, are not large. At the center of the front a small mass of rock has just been uncovered by the ice, and there is another small mass just appearing about a third of the way from the center to the north side of the front (Fig. 11). On both sides of the glacier is a marked bare zone, and on the south side in this bare zone is a lateral moraine. When the ice extended out over this bare zone, possibly ten years ago, the front was about a quarter of a mile in advance of its present position. Much earlier (several centuries old) and much more advanced positions of the Aialik Glacier are indicated by shoals, caused by morainic accumulations, across the head of Aialik Bay, opposite and a mile north of the front of the Pedersen Glacier.

PEDERSEN GLACIER

The Pedersen Glacier ends on a gravel flat four miles south of the Aialik Glacier. Toward its end the Pedersen Glacier is smooth, deploys upon a glacial flat, and is reached by high tide along its center (Fig. 10). On the northern side of the front there is a per-

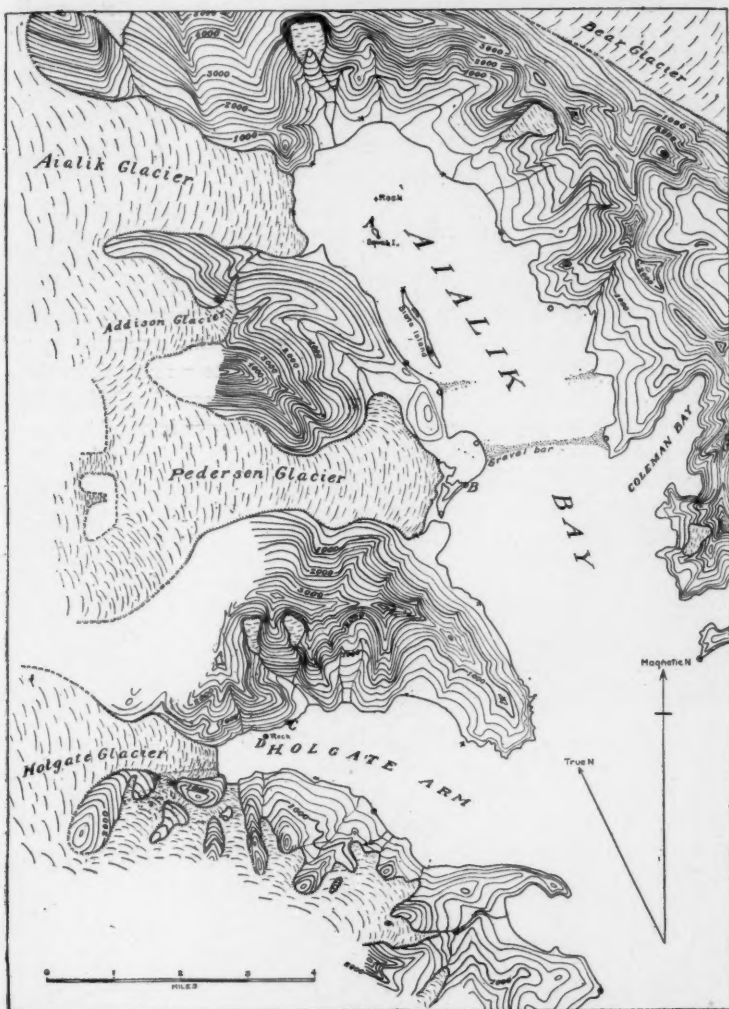


FIG. 10.—Map of the upper part of Aialik Bay, July 22–24, 1909. Occupied points are indicated by circles, intersected points by crosses; contour interval 200 feet.

pendicular cliff of ice perhaps 100 feet in height. This glacier also has no medial moraine and has a well-marked bare zone on each side of the front. On the north side this zone is approximately 200 feet in height where it touches the ice, and it extends a third of a mile

east from the present front of the glacier (Fig. 12). Along much of the front a quarter to a third of a mile from the ice are the remains of a low moraine which has now been nearly cut away by the waves. On this moraine are herbaceous plants and some alders about two feet in height. The moraine was probably deposited at the time when the glacier advanced to the edge of the bare zone mentioned above. This advance may have been fifteen years ago and apparently marks the maximum advance of the glacier since the advent of the present forest.

HOLGATE GLACIER

The Holgate Glacier lies at the head of the main westerly branch of Aialik Bay and reaches tide water in two streams separated by a small mass of rock which not many years ago was a nunatak in this glacier. (Fig. 13.) The western and larger stream is discharging rapidly, but the discharge from the southern stream is small. Near the south side of the larger stream is a small medial moraine, but the glacier as a whole is free from medial moraines. The same statement can be made concerning the other glaciers on the west side of Aialik Bay. They all come from an extensive snow field which has few bare peaks rising above its surface. About three-fourths of a mile east of the front of the northern stream of the Holgate Glacier is a rounded reef (Point D, shown in Fig. 10) recently glaciated and now covered by the highest tides. There are no trees on the sides of Holgate Bay within 1.25 miles of its head, and beyond this the forest is sparse. There are no bushes and very few herbaceous plants close to sea level from the glacier to a quarter of a mile east of the reef mentioned above. The rock mass between the two parts of the glacial front has bushes only on its upper half on the front and upper fourth on the sides (Fig. 13). In very recent years then, possibly within the twentieth century, the front of the Holgate Glacier was about a mile in advance of its present (1909) position.

NORTHWESTERN GLACIER

This magnificent glacier (Figs. 14, 15 and 16) reaches the ocean at the head of Harris Bay, the second large bay southwest of Resurrection Bay. The Northwestern is one of the largest ice streams of the Kenai Peninsula and is in full view from the open ocean. This glacier and its surrounding lofty peaks form the most striking scenic feature of the southern shore of the Kenai Peninsula. The Northwestern Glacier, which we named after Northwestern Uni-



FIG. 11—North side of front of the Aialik Glacier, from Point A of Fig. 10, July 23, 1909.
At the extreme left is a mass of rock recently uncovered by the ice;
this rock is in about the center of the glacial front.



FIG. 12—North side of front of the Pedersen Glacier, from Point B of Fig. 10, July 23, 1909.

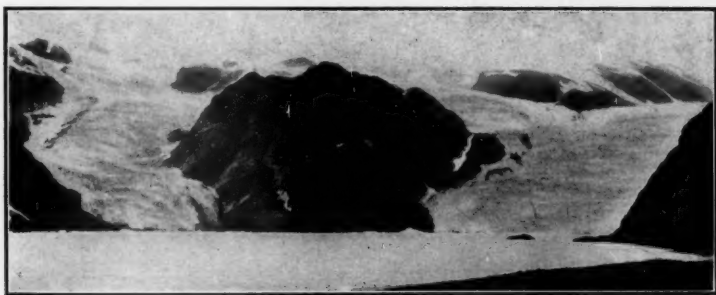


FIG. 13—Front of the Holgate Glacier, from Point C of Fig. 10, July 24, 1909. The small reef in front of the right part of the glacier is Point D of Fig. 10; this reef is now three-fourths of a mile from the ice front, but was covered by the ice possibly within the twentieth century.

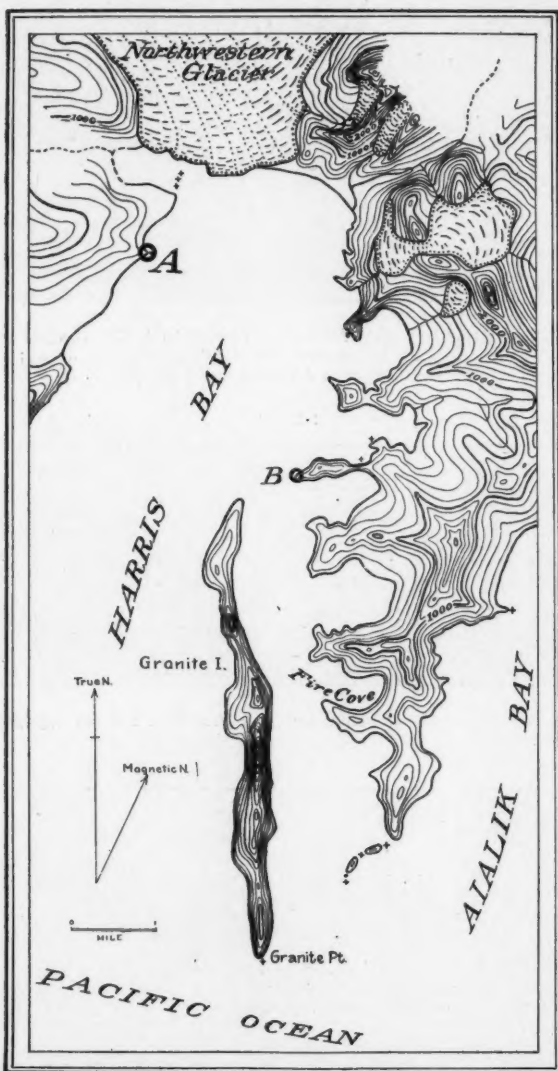
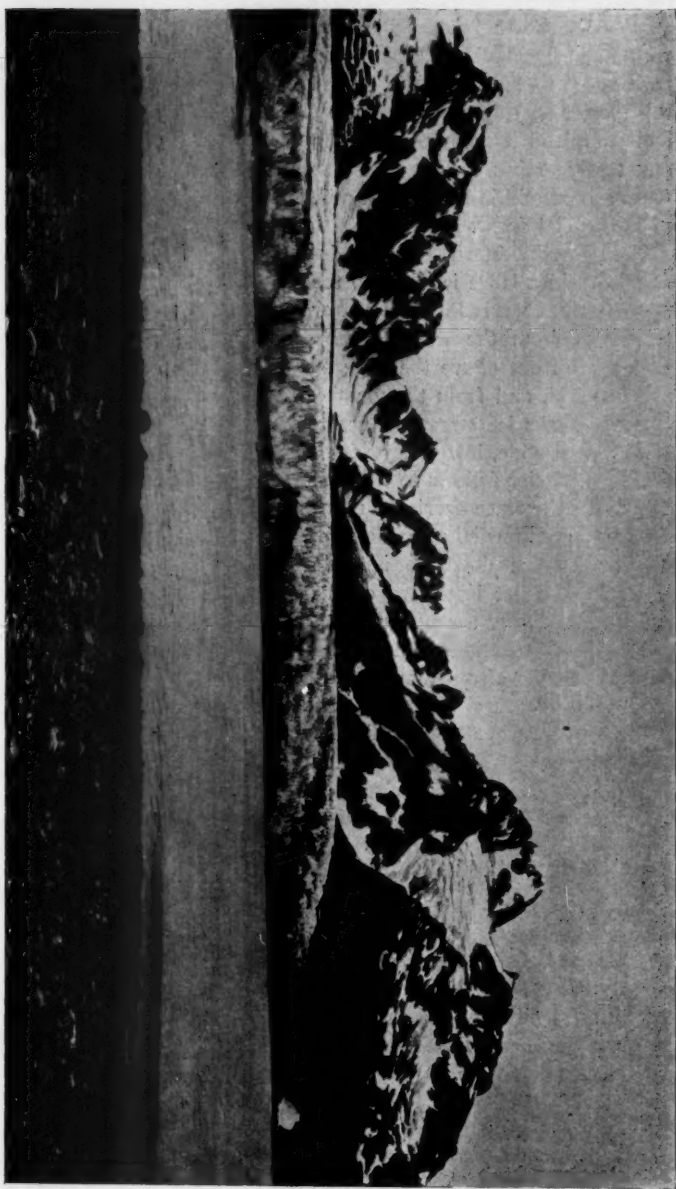


FIG. 14—Sketch map of Harris Bay and Northwestern Glacier, July 27, 1909. Contour interval 200 feet. Fire Cove and the adjacent similar coves are drowned cirques.

FIG. 15.—Eastern part of front of Northwestern Glacier, from Point A of FIG. 14, July 27, 1939. The high peak on the left is the same peak as is shown on the right of FIG. 16.



versity, is shown by Tebenkof, as mentioned by Davidson,* as reaching almost to the sea. We visited this glacier on July 26 and 27, 1909, and examined it from points from one to five miles distant and also from a boat within less than a mile of the glacial front.

The Northwestern Glacier descends from a large ice field to the northeast of Harris Bay. Eight or ten miles from the water several peaks stand out above the edge of this ice field, and from the vicinity of these peaks ice streams descend rapidly to a wide, low valley which the main glacier follows to the sea. The glacial surface carries a number of marked medial moraines, six of which come down to its tide water frontal; at least two others end in the hills to the north. The peaks just mentioned and the medial moraines from them are of reddish granite, and the surface of the glacier is thus striped by bands of a buff color. The west quarter of the front of the glacier forms a steep cliff and is discharging rapidly. The eastern half of the front lies on a gravel flat, the eastern portion of which is not covered by high tide. On both sides of the front there is a bare zone between the glacier and the forest. This zone extends a quarter of a mile beyond the front of the glacier and is estimated to reach 150 feet in height above the

* Davidson, George. The glaciers of Alaska that are shown on Russian charts or mentioned in older narratives. *Trans. and Proc. Geog. Soc. of the Pacific*, series 2, vol. 3, 1904, pp. 1-98.



FIG. 16.—General view of Northwestern Glacier, from Point B of Fig. 14, July 27, 1909.

glacier near the front. The front of the Northwestern Glacier is now (1909) about a quarter of a mile from its maximum advance since the growth of the present forest. This maximum position was occupied perhaps 10 to 15 years ago.

NUKA BAY

Nuka Bay is the large inlet lying just west and northwest of the Pye Islands. It has several arms or branches. At the head of the eastern arm is the McCarty Glacier, the most westerly to reach tidewater on the southern shore of the Kenai Peninsula. The Split Glacier ends about two miles from the head of the northern arm. On the southwest shore of the northwest arm are at least four glaciers, but none of them ends near sea level. The western arm (Yalik Bay) has no glaciers draining into it. On the western side of Nuka Bay south of Yalik Bay are two larger glaciers (Yalik and Petrof) and several smaller ones which do not reach the sea but whose waters drain into Nuka Island passage.

MCCARTY GLACIER

The McCarty Glacier reaches the sea at the head of the northeastern arm of Nuka Bay (Figs. 17 and 18). This glacier has a prominent medial moraine in its western half, and this moraine stands up above the ice surface as a ridge. The front of the glacier deploys in semi-circular form on a gravel flat which is mainly above sea level. At the center of its front, however, the glacier reaches tide water and in places presents a steep mural escarpment about 200 feet in height. From this wall ice blocks fall into the water, which is so shallow that the larger bergs do not float away.

On the east of the front of the McCarty Glacier is a broad pitted plain and nearer the ice are morainic ridges which mark an advance

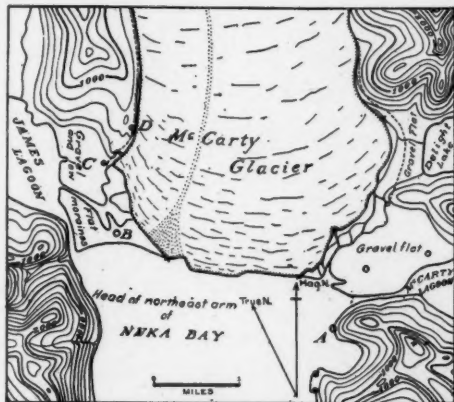


FIG. 17.—Map of front of McCarty Glacier, July 30, 1909. Occupied points are indicated by circles, intersected points by crosses; dotted lines at side of glacier indicate limits of bare zone; contour interval 200 feet.

of the ice some years ago. Between the glacier and Delight Lake these morainic ridges reach a height of sixty feet. South of this lake a rock ridge extends westward to within about a quarter of a mile of the glacier. The end of the ridge is of bare rock and has been glaciated up to a height of 250 feet, at which elevation the ice invaded a mature forest and killed many of the trees which are now without bark and are mostly lying on the ground. Among them are live spruces, the largest of which are twelve feet high and six inches in diameter. The advance of the ice which destroyed these larger trees and constructed the morainic ridges just mentioned occurred perhaps fifty years ago and is the extreme advance of the eastern part of the glacier since the growth of the present forest.

The extreme western side of the McCarty Glacier falls abruptly over the point of a rock ridge some 350 feet in height. From the top of this ridge and just west of the ice (Point D of Fig. 17) an excellent view of the glacier and its environs is obtained. Here are two lateral moraines now beyond the edge of the ice. The older and outer of these moraines is not very well defined and varies from a few feet to twelve feet in height. Moss and young spruce trees cover most of the surface of this moraine, and in it are numerous bits of wood and fragments of logs and stumps. Just outside of this moraine (*i. e.*, to the west) is a forest, practically all of whose trees near the ice were killed at apparently the same time that the



FIG. 18—Central part of front of McCarty Glacier, from Point A of Fig. 17, July 30, 1909.

moraine was formed. These trees are in about the same state of decay as the fragments of trees in the moraine, and they are all in a more advanced stage of decomposition than the trees at any other locality described in this report where forests have been invaded by the ice, excepting the forest destroyed by the maximum advance of the eastern part of the Columbia Glacier. This maximum extent of the western part of the McCarty Glacier probably occurred at the same time as the maximum advance shown on the eastern side of the same glacier.

To the east of the above lateral moraine is another similar, but much younger, moraine. On this there is little moss, but many young spruce trees one to twelve inches high.

THE REAL NEW YORK IN 1910

BY

MARK JEFFERSON

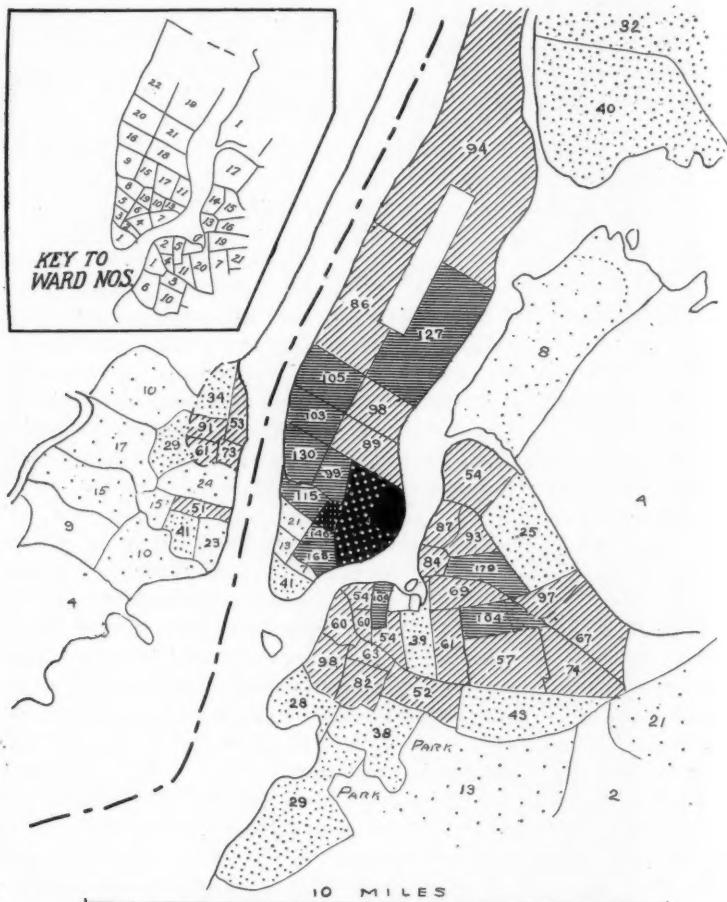
According to the Thirteenth Census, the "city" at the mouth of the Hudson now contains 4,736,000 inhabitants, and 369,000 suburbanites dwell under the same city government with them, the distinction being made that city dwellers inhabit continuous areas every part of which has 10,000 or more people to the square mile. (*Bulletin*, Sept. 1909, p. 544.) All live within the charter limits of New York, Jersey City and Hoboken, making one great group of population about the port.*

Here men dwell closer together than anywhere else in the world, as far as statistics reach. At the time of the Twelfth Census, Ward 10 in Manhattan was thronged with people at the rate of 418,000 to the square mile. That is between the Bowery and Norfolk, Rivington and Division Streets. In the recent decade this has diminished to 386,000, but the density in Ward 11, which lies just east of Tompkins Square, had risen above 446,000. Furthermore, the new enumeration in city blocks shows a third of the blocks in Ward 11 to have more than 500,000 inhabitants to the mile. In fact, it appears probable by studies being made on these data that the five blocks east of Broadway between Delancey and Broome Streets have each more than 600,000 to the mile density.

The map denotes this eastward shifting of the densest population by the black shade of Ward 11. The withdrawing of the popu-

* If Newark were included in the group, the numbers would become 5,044,444 and 409,000.

lation eastward into the "heel" of Manhattan's well-filled stocking is accompanied by a simultaneous vacating of the "toe." Ward 2, south of the Brooklyn Bridge and west of Fulton Market, had 1,488 inhabitants in 1900 and has now but 933. Its density of population, therefore, has dropped from 12,000 per square mile to 7,000. The ward now has less than "city" density! Not, of course, that it has in any sense become suburban; on the contrary, it has taken on a



Sketch Map of the Density of Population of the "Anthropographic" City of New York. Scale 1:180,000 approx. Figures denote density of population in thousands to the square mile. [Ward 19 on Key Map, lying south of Ward 15, should read 14.]

special character met with only in the heart of great cities, where public and office buildings replace dwellings on land too costly to use for residence. Precisely its location in the midst of a great group of people has given this high value that drives residents away. Manhattan's case is the most extreme known, as the concentration of business there is enormous. The famous illustration in London, The City, has still the very considerable density of 18,000 per square mile in its thinnest borough, All Hallows, Barking. Yet the greatest density in the closer settled region about was 204,000 at Stepney. New York had 418,000 in Ward 10 and close by.

The adjoining Fifth Ward has also lost many people. Further up the island at West 33rd Street, 16,500 people have been displaced during the decade to make room for the new Pennsylvania Railroad Terminal station. "Five blocks were cut out, with 500 city homes." So there, too, the population density has fallen from 129,000 to 105,000. Ward 18 in Manhattan catches the eye as less thickly settled than its neighborhood, but four parks count in its area:—Madison Square, Gramercy, Union Square and Stuyvesant. If settled about as neighboring areas they would bring the density up a little above 100,000 per mile. Mulberry Bend Park in Ward 6 reminds us of Mr. Riis's battle with the slums and an intentional reduction of density.

In Brooklyn the central wards 2, 3 and 11 have lost people to the total amount of nearly 5,000. On the other hand, the suburban Ward 29, "Flatbush," has come up from 27,188 to 73,048. In 1900 its density was 5,000 per square mile. It is now 13,000.

In Queens, which was all suburban in 1900, most of Ward 1 is now urban. The density is 8,000, but it is due to unoccupied land at the extremities of the ward rather than to thinness of the whole. For this reason it has been included in the anthropographic city.

The suburban parts of the metropolis are therefore:—all of Richmond Borough (Staten Island), 85,969 people; all but the First Ward of Queens, on Long Island, 222,278 people; Wards 31 and 32 in Brooklyn, Gravesend and Flatlands, with 38,022 people; in all, for political New York, 346,269 suburbanites. In Jersey City, Ward 7 has 22,616 suburban people. Hoboken has none. The totals for 1910 are:

	OFFICIAL.	ANTHROPOGRAPHIC.
New York.....	4,767,000	4,421,000
Jersey City.....	268,000	245,000
Hoboken.....	70,000	70,000
	5,105,000	4,736,000*

* Newark has Wards 8 and 12 suburban, with 39,895 inhabitants. Its figures are 347,000 and 307,000. If added to the above they give 5,432,000 and 5,043,000.

If the above figures be compared with those of 1900 (*Sept. Bull.* 1909), it is seen that proportionally as well as actually the greatest growth is in Greater New York, which grew 40 per cent. Jersey City grew 24 per cent. and Hoboken 18 per cent. At Brooklyn in the interval the anthropographic city added 504,487 to its inhabitants, a growth of 46 per cent. Manhattan added 481,449 or 27 per cent. Henceforth, therefore, the main growth is to be looked for across the East River. A comparison of the densities mapped with those of 1900 will disclose how far this has already proceeded.

By 1920 the "city" at the Hudson mouth will certainly contain more than 6,000,000 inhabitants. Its present growth is about 133,000 annually. For the next five years it should have:—

1910.....	4,736,000	1913.....	5,135,000
1911.....	4,869,000	1914.....	5,278,000
1912.....	5,002,000	1915.....	5,411,000

THE PURPOSE AND POSITION OF GEOGRAPHY*

BY

COLONEL C. F. CLOSE, C.M.G., R.E.

I propose to devote the first part of this address to an examination of the purpose and position of Geography, with special reference to its relations with other subjects. It will not be possible entirely to avoid controversial matters; but, if some of the questions touched on are controversial, this only means that these questions have a certain importance. I shall try to describe the facts of the case impartially.

In the second part I shall try to indicate briefly what the Government, as represented by the great Department of State, is doing for Geography.

PART I.—THE POSITION OF GEOGRAPHY WITH REFERENCE TO OTHER SUBJECTS

It is no secret that the geographical world is not unanimous about the meaning and object of Geography. The definitions suggested by such writers as Mr. Chisholm, Professor Davis, Professor Herbert-

* Presidential Address to the Geographical Section of the British Association, Portsmouth, England, August, 1911.

son, Mr. Mackinder, or Dr. Mill, are not in agreement. From time to time an attempt is made to formulate some statement which shall not commit the subscribers to anything very definite. But differences of opinion on the subject persist.

There are, of course, a great many ways of approaching the question. Let us, for example, examine the proceedings of such representative bodies as the British Association and the Royal Geographical Society, and of such assemblies as the International Geographical Congresses, and let us see if we can find out what is, as a fact, the scope of the subject as dealt with by these bodies. They are institutions which work in the full light of day, and they are too large to be dominated for any length of time by individuals. If we can find any working principle, any common term, amongst these societies, we shall have gone some way towards arriving at a solution of the problem.

A simple method of investigation is to discuss the character of the publications of these societies and of the lectures delivered before them. And I feel that I cannot do better than devote most of this brief analysis to the Royal Geographical Society and its admirably edited Journal. Here we are on safe ground. If an inhabitant of another planet wished to know what we understand by astronomy we could confidently refer him to the Monthly Notices of the Royal Astronomical Society. If he were curious about the condition of geology, we should give him the volumes of the Geological Society. And, if he were so rash as to ask what are the objects of the modern mathematician, we should hand him the papers published by the London Mathematical Society. The "Geographical Journal" occupies no lower a position with reference to Geography than do the other journals mentioned with reference to the sciences with which they deal.

In analyzing the contributions to the Royal Geographical Society it is important to start with an honest classification. In the endeavor to be impartial I have chosen the classification which was adopted for the last International Geographical Congress, *i. e.*, that held at Geneva in 1908. This Congress was divided into fourteen sections. It will serve to clear the ground if we deal first with sections 12, 13, and 14; these are the Teaching of Geography, Historical Geography (which was mainly concerned with the history of travel and exploration), and Rules and Nomenclature. For the purpose of discovering what Geography is these three sections will not be of any assistance. Every subject has its educational side, its history, and its rules and nomenclature. The subject proper was,

therefore, divided into eleven sections. The eleven sections are the following:

1. Mathematical and Cartographical Geography.
2. General Physical Geography.
3. Vulcanology and Seismology.
4. Glaciers.
5. Hydrography (Potamography and Limnology).
6. Oceanography.
7. Meteorology and Climatology; Terrestrial Magnetism.
8. Biological Geography.
9. Anthropology and Ethnography.
10. Economic and Social Geography.
11. Explorations.

Before applying this classification to the work of the Geographical Society I wish to call attention to the extremely frank way in which vulcanology, seismology, meteorology, climatology, terrestrial magnetism, anthropology, and ethnography, are included in Geography. The list in fact covers ground occupied by several sections of the British Association.

I have investigated the work of the Geographical Society for the five complete years 1906 to 1910. The original contributions to the "Geographical Journal" have been examined for that period, omitting from consideration contributions on the subjects of teaching, the history of exploration, and rules and nomenclature.

There are altogether 296 original papers which come under one or another of the eleven headings given above. Of these papers, 171, or 57 per cent., deal with Explorations and Travels. There is a great drop to the next largest section, General Physical Geography, which accounts for thirty papers, or about 10 per cent. Adhering to the order of the Geneva Congress the complete list is as follows:

ORIGINAL CONTRIBUTIONS TO THE PROCEEDINGS OF THE ROYAL
GEOGRAPHICAL SOCIETY DURING THE FIVE YEARS 1906 TO 1910

SUBJECT	PERCENTAGE
1. Mathematical and Cartographical Geography.....	3
2. General Physical Geography	10
3. Vulcanology and Seismology	5
4. Glaciers	3
5. Hydrography (Potamography and Limnology)....	5
6. Oceanography	3
7. Meteorology and Climatology; Terrestrial Magnetism	3

SUBJECT	PERCENTAGE
8. Biological Geography	1
9. Anthropology and Ethnography	3
10. Economic and Social Geography.....	7
11. Explorations	57

The main conclusion is obvious enough. For the principal Geographical Society in the world, Geography is still mainly an affair of explorations and surveys; if to this item we add cartography we account for 60 per cent. of the activities of the Society.

There is another important deduction which is natural and unforced: the papers on vulcanology and seismology and on glaciers could have been read with perfect appropriateness before the Geological Society; those on meteorology and climatology before the Meteorological Society; and those on anthropology and ethnography before the Anthropological Society. To make quite sure of this point I will cite a few titles of the papers read: "The great Tarawera Volcanic Rift," by J. M. Bell; "Recent Earthquakes," by R. D. Oldham; "Glacial History of Western Europe," by Professor T. G. Bonney; "Climatic Features of the Pleistocene Ice-Age," by Professor A. Penck; "Rainfall of British East Africa," by G. B. Williams; "Geographical Distribution of Rainfall in the British Isles," by Dr. H. R. Mill; "Geographical Conditions affecting Population in the East Mediterranean Lands," by D. G. Hogarth; "Tribes of North-Western Se-Chuan," by W. N. Fergusson.

This little list of typical subjects indicates clearly that there is a large group of contributions which would have found an appropriate home in the journals of the Geological, Meteorological, and Anthropological Societies; there is a possible corollary that, since men who make a life study of these subjects are best capable of dealing with them, the authors of the above type of paper who submit their work to the Geographical Society, in so doing appeal rather to the public at large than to men of their own special sciences.

We may therefore sum up the results of this brief investigation into the work of the Royal Geographical Society by saying that 60 per cent. of it is concerned with exploration and mapping, and that some of the remainder could be dealt with appropriately by the learned societies concerned, but that the Geographical Society serves as a popularizing medium. It also serves a useful purpose as a common meeting-ground for vulcanologists, seismologists, oceanographers, meteorologists, climatologists, anthropologists, and ethnographers.

Another line of investigation may be profitably pursued. Who are, by common consent, the leading geographers of the world? No doubt the explorers come first in popular estimation, such men (omitting British names) as Peary, Charcot, Sven Hedin. Then after this type would come the men of learning who stand out in any International Congress. These men stand out because they have, by their own exertions, increased the sum of human knowledge. Omitting for the moment the consideration of exploration and mapping, we find that in an international congress a large number of the most celebrated geographers are eminent as geologists. In such a gathering we can also pick out those who have advanced the sciences of meteorology or anthropology. Now let us suppose the position reversed. Let the functions of geology be supposed to be somewhat in dispute and those of geography perfectly definite, and further let us suppose that at an international meeting of geologists a large proportion of the men of real distinction were geographers. We may in this way get an idea of what geography looks like from the outside.

I think that at this point we may explain, in a preliminary way, the work of the Geographical societies, after the fashion of the "Child's Guide to Knowledge":

Question: What is Geography?

Answer: There is no generally accepted definition of Geography.

Question: Can we not form some idea of the scope of the subject by considering the work of the Royal Geographical Society?

Answer: Yes; 60 per cent. of this work deals with explorations, surveys, and mapping, and of the rest a considerable portion consists of matter which could be discussed appropriately before the Geological, Meteorological, and Anthropological Societies.

Question: What, then, leaving maps out of consideration, are the useful functions of a Geographical society?

Answer: A Geographical society serves to popularize the work of men who labor in certain fields of science, and such a society forms a very convenient meeting-ground for them.

Question: What is a geographer?

Answer: The term geographer is sometimes applied to explorers; sometimes to men who compile books derived mainly from the labors of surveyors, geodesists, geologists, climatologists, ethnographers and others; sometimes to those who compile distributional maps.

Question: Can a geographer who has not made a special study of one or more of such subjects as geodesy, surveying, cartography, geology, climatology, or ethnography, hope to advance human knowledge?

Answer: He can do much to popularize these subjects, but he cannot hope to do original work.

Another way of attempting to ascertain the meaning and object of Geography is to study the character of the instruction given in

the universities, and we may suppose that this can be fairly judged by the contents of standard text-books. Let us take, for example, the "*Traité de Géographie Physique*" of M. E. de Martonne, formerly Professor of Geography at the University of Lyons, now Professor at the Sorbonne. The work in question was published in 1909 and is divided into four main sections—Climate, Hydrography, Terrestrial Relief, and Biogeography.

The first sentence of the book is "What is Geography?" Twenty-four pages are devoted to discussing this question, which the writer, with all his skill and learning, finds it difficult to answer definitely and convincingly. One receives the impression of the dexterous handling of a difficult question, and of a generally defensive attitude. In this book geography is said to depend on three principles. The principle of *extension*, the principle of *co-ordination*, and the principle of *causality*. As an illustration of the meaning of the principle of extension, we are told that "the botanist who studies the organs of a plant, its conditions of life, its position in classification, is not doing geographical work; but if he seeks to determine its area of extension, *il fait de la géographie botanique*. I believe that we have here reached a critical point. The claim is, that when, in the prosecution of a botanical study, a map is used to show the distribution of a plant, the use of such a map converts the study into a branch of geography. Well, it is a question of definition and convention, which cannot, I imagine, be settled except by the general agreement of all the sciences. We have to make up our minds whether a man who constructs a distributional map is doing "geography." One thing, I suppose, is not doubtful. When the map is made it will be better interpreted by a botanist than by a person ignorant of botany. In the same way the discussion of an ordinary geological map is best undertaken by a geologist, and so on. It would appear that geography, in the sense mentioned, is not so much a subject as a method of research.

It will be convenient here to say a few words about the relations between societies and schools of Geography and those two important subjects geodesy and geology. Curiously enough, there is not, and has never been, in the United Kingdom a society or body specially charged with the study of geodesy. Geodesy, in fact, has no regular home in these islands. But the Royal Geographical Society has done a good deal in the past few years to stimulate an interest in the subject, thereby fulfilling what I believe to be one of the Society's most useful functions, that of popularization.

If, however, an authoritative opinion were required on any geo-

detic question, where could it be obtained? Well, I suppose there is no doubt that the headquarters of this branch of learning is the International Geodetic Association, but the scientific work itself is being largely carried out at the Geodetic Institute at Potsdam, by the Survey of India, by the Geodetic Section of the Service Géographique, by the U. S. Coast and Geodetic Survey, and by similar bodies. Geodesy, especially in its later developments, is a definitely scientific subject which demands much study and application. It is but slightly touched upon by the schools of Geography. Perhaps I may here point out that geodesy is by no means mainly concerned with the shape of the spheroid. The chief problems are now those of isostasy and local attraction generally, the real shape of the sea-surface, the continuity of the crust of the earth and changes of density therein.

The position in which Geography finds itself with regard to Geology can be clearly seen if reference is made to the new edition of the "Encyclopædia Britannica." In the eleventh volume of this work are two important articles, "Geography," by Dr. H. R. Mill, and "Geology," by Sir Archibald Geikie. In the article on "Geography" we find a description of geomorphology as that part of Geography which deals with terrestrial relief, and a remark is made that "opinion still differs as to the extent to which the geographer's work should overlap that of the geologist." In this article, however, most of the authorities quoted are geologists, and the author remarks that "the geographers who have hitherto given most attention to the forms of the land have been trained as geologists."

Turning to the article on "Geology" we find an important section on "Physiographical Geology," which is described as dealing with the investigation of "the origin and history of the present topographical features of the land." Now this is the exact field claimed for geomorphology. It has been observed by others, notably by Professor de Martonne, that the interpretation of topographic forms has been most successfully undertaken by geologists, and he gives as an instance of this the good work done by the United States Geological Survey.

I do not know whether any geographer untrained as a geologist has contributed anything of value to geomorphology.

Another test which may be applied is the following: Let us imagine Geography to be non-existent and note what the effect would be. Suppose there were no such things as Government Geographical Services, or Schools of Geography at the Universities, or Geographical Societies. The first and most obvious result would be that

most, if not all, of our apparatus of exploration and mapping would have disappeared. But as we are all in agreement as to the necessity of this branch of human effort, let us restore this to existence and examine the effect of the disappearance of the rest.

So far as concerns geodesy, we should still possess the International Geodetic Association, the Geodetic Institute at Potsdam, and the United States Geodetic Survey, and similar bodies. But we should have lost the means of popularizing geodesy in the proceedings of Geographical Societies; and, as there would be now no geographical text-books, elementary geodesy would not find itself between the same covers as climatology and geomorphology.

As regards geomorphology, or physiographical geology, not very much difference would be noted. The geologists would still pursue this important subject; but here again their writings would perhaps appeal to a more expert and less popular audience; although it is not to be forgotten that many admirable introductions to the subject have been written by geologists.

Much the same might be said about meteorology and climatology. There would be text-books devoted to these studies, but there might be a diminution of popular interest.

Such names as phyto-geography would disappear, but the study of botany (if we permit it the use of distributional maps) would not be affected. The loss to knowledge would be mainly that of getting to a certain extent out of touch with the public. The constitutions of the various learned bodies would remain the same and so would their functions. The constitution of the Royal Society, which has never recognized geography as a subject, would be totally unaffected.

If we thus study the relations between Geography and other subjects we are almost bound to arrive at the conclusion that Geography is not a unit of science in the sense in which geology, astronomy, or chemistry are units. If we inquire into the current teaching of Geography, and examine modern text-books, we find that most of the matter is derived directly from the workers in other fields of study. And if we inquire into the products of Geographical societies, it becomes evident that one of the most important functions fulfilled by these useful bodies is to popularize the work of geodesists, geologists, climatologists, and others, and to provide a common meeting ground for them. If Geography had been able to include geology and the other sciences which deal with earth-knowledge, it would then, indeed, have been a master science. But things have worked out differently.

I shall very probably be told that, in laying some stress on the above-mentioned aspects of the subject, I have forgotten that the main purpose of Geography is the study of the earth as the home of man, or the study of man as affected by his environment, and that, however necessary it may be to begin with a foundation of geodesy, geology, and climatology, we must have as our main structure the investigation of the effect of place conditions on the races of man, on human history and human industry, on economics and politics.

It is obviously and abundantly true that no student of history, economics, or politics can disregard the effect of geographical environment. But it is not, as a fact, disregarded by writers on these subjects. The question is, to a large extent, whether we should annex these portions of their studies, group them and label them "Geography." Our right to do this will depend on the value of our own original investigations. We have the right to use the results obtained by others, provided that we add something valuable of our own.

Before this human aspect of geography—or, for that matter, any other aspect of the subject—is recognized by the world of science as an independent, indispensable, and definite branch of knowledge, it must prove its independence and value by original, definite, and if possible, quantitative research.

PART II.—GEOGRAPHY AND THE GOVERNMENT DEPARTMENTS

Whatever definition of Geography is accepted we are all in agreement that the map is the essential foundation of the subject. I propose now to indicate very briefly how the British Government, as represented by the great Departments of State, is, in this respect, assisting the cause of Geography. The Departments which are interested in maps and surveys are the following:—The Admiralty, the War Office, the Colonial Office, the India Office, the Board of Agriculture, and the Foreign Office.

The immense services rendered, not only to this country, but to the whole world, by the Hydrographic Department of the Admiralty, are known to all. But it would be somewhat rash for a soldier to talk about hydrographic surveys, so I will confine my remarks to surveys on land.

First it should be remarked that the British Government as a whole has for many years shown its interest in Geography, and has recognized the good work done by the Royal Géographical Society by contributing an annual sum of 500*l.* towards the funds of the

Society. Next it should be noted that from time to time British Governments have contributed large sums of money towards Arctic and Antarctic exploration. The most recent examples of this very practical form of encouragement will be remembered by all; I mean the Government expenditure on Scott's first Antarctic Expedition and the handsome sum contributed towards the cost of Shackleton's great journey.

Turning now to the War Office, the first matter to which I would call attention is that nearly all the accurate topographical surveys of the Empire have been started by soldiers. This applies to the United Kingdom, Canada, Australia, South Africa, Tropical Africa, and last, but greatest of all, India. The accounts of the struggles of soldiers at the end of the eighteenth century to obtain sanction for what is now known as the Ordnance Survey form very interesting reading. In fact, all over the world it was military requirements which produced the topographical map; and it is still the War Offices of the world which control the execution of almost all geographically important surveys. During the last few years the largest block of work undertaken by the War Office has been the accurate survey of the Orange Free State, which has an area of about 52,000 square miles—nearly the size of England—and an adjacent reconnaissance survey in the Cape of Good Hope covering an area of a hundred thousand square miles. There has been some inevitable delay (due to causes which need not be gone into now) in the publication of the sheets of this survey, but the work is being pushed on. The survey of the Orange Free State is fully comparable with the admirable surveys carried out by the French Service Géographique de l'Armée in Algeria and Tunis. Some work has also been done in the Transvaal. Other surveys carried out in recent years under the direct control of the War Office are those of Mauritius, St. Helena, a portion of Sierra Leone, Malta, and Hong Kong. The most notable work which is now being carried out in the Self-Governing Dominions is the Militia Department Survey of Canada, with which excellent progress has been made.

The total area of the Crown Colonies and Protectorates, under the rule of the Colonial Office, amounts to about two million square miles. British African Protectorates form a large portion of this total, and I will indicate briefly what is being done to survey these tropical Protectorates. From the geographical point of view the brightest regions are East Africa, Uganda, and Southern Nigeria. In East Africa topographical surveys of the highlands and coast belt are being pushed on by military parties as part of the local survey

department. The area of exact work done amounts now to some 30,000 square miles. In Uganda a military party has recently completed a large block of country, and in this Protectorate thoroughly reliable maps of 32,000 square miles are now available. In Southern Nigeria a completely reorganized survey department is tackling in a thoroughly systematic fashion the difficult task of mapping a forest-clad country. We shall shortly see the results.

For the information of those who have not travelled in Tropical Africa it should be remarked that surveying in such countries is attended by every sort of difficulty and discomfort, and too often by illness and serious discouragement. It is one thing to sit at home in a comfortable office and plan a scheme of survey, and quite another thing to carry it out on the spot. We do not, I am convinced, give enough honor and credit to those who actually get the work done in such trying circumstances. Honest accurate survey work in the tropics puts a much greater strain on a man than exploratory sketching. To picture what the conditions are, imagine that you are to make a half-inch survey of the South of England; cover the whole country with dense forest; put mangrove swamps up all the estuaries; raise the temperature to that of a hot-house; introduce all manner of insects; fill the country with malaria, yellow fever, blackwater fever, and sleeping sickness; let some of your staff be sick; then have a fight with the local treasury as to some necessary payment, and be as cheerful as you can. That is one side of the medal. On the other side there is the abiding interest which the surveyor feels in the country, the natives, and the work; the sense of duty done; and the satisfaction of opening up and mapping for the first time a portion of this world's surface.

There is no time to mention other surveys in Africa, and I will pass on to a very interesting part of the world, the Federated Malay States. In this prosperous country much excellent geographical work is being done by the combined survey department which was established under a Surveyor-General in the year 1907. The department is in good hands, and the commencement of a regular topographical series is being undertaken.

I wish it were possible to prophesy smooth things about Ceylon. From our special point of view the situation leaves much to be desired. There is not yet published a single topographical map, and the topographical surveys are progressing at a rate which, under favorable conditions, may result in the maps being completed in the year 1970.

In closing this inadequate review of the principal surveys which

are being undertaken in the Crown Colonies and Protectorates, I should mention that the co-ordinating factor is the Colonial Survey Committee, which every year publishes a report which is presented to Parliament.

The India Office is of course concerned with that great department the Survey of India. The Indian Empire has an area of about 1,800,000 square miles, and as, under the arrangements approved in 1908, the standard scale of survey is to be one inch to one mile, the area of paper to be covered will be 1,800,000 square inches. Actually this is divided into about 6,700 sheets. The Survey of India has always been famous for its geodetic work and for its frontier surveys and methods. Its weak point used to be its map reproduction. This has been greatly improved. But personally I feel that if, for most military and popular purposes, a half-inch map is found suitable for England, as is undoubtedly the case, there is no reason why a half-inch map should not also be suitable for India. It is mainly a question of putting more information on the published map, and of engraving it and using finer means of reproduction. If this smaller scale were adopted all the information now presented could be shown, and the number of the sheets would be reduced from 6,700 to 1,675, a saving of 5,000 sheets. It is difficult to avoid the feeling that the Survey of India is over-weighted with the present scheme. The scheme has, however, many merits. It will be impossible to carry it out unless the department is kept at full strength.

The Board of Agriculture is the Department which is charged with the administration of the Ordnance Survey. The Ordnance Survey spends some £200,000 a year, and for that sum it furnishes the inhabitants of the United Kingdom with what are, without doubt, the finest and most complete series of large-scale maps which any country possesses. There is nothing in any important country (such as France, Germany, Italy, Russia, or the United States) to compare with our complete and uniform series of sheets on the scale of $\frac{1}{2500}$. These sheets are sold at a nominal price and are in effect a free gift to landowners, agents, and all who deal with real property. They are also, of course, invaluable to country and borough engineers and surveyors. They really are a national asset which is not half enough appreciated. The whole conception of these large-scale plans has stood the test of time and is greatly to the honor of a former generation of officers.

Much might be said about the small-scale maps of the Ordnance Survey, which are now published in a very convenient form. As mentioned below, the latest small-scale Ordnance map is the new

International Map on the million scale. Some sheets of this map will shortly be published.

The Foreign Office is concerned with the surveys of the Anglo-Egyptian Sudan, which are at present mainly of an exploratory character. The taking over of the Province of Lado has recently thrown fresh work on the Sudan Survey Department. The Foreign Office, which administers Zanzibar, has recently given orders for the survey of the Island of Pemba, a dependency of Zanzibar, and this is being carried out by a small military party.

But the greatest service to Geography rendered by the Foreign Office in recent years was the encouragement given to the project of the International Map by the assembly of an international committee in November 1909. Sir Charles, now Lord, Hardinge presided at the opening session. There were delegates from Austria-Hungary, France, Germany, Great Britain, Canada and Australia, Italy, Russia, Spain and the United States, and, as is known, the resolutions which were devised by the Committee were agreed to unanimously. After the conclusion of the work of the Committee the Government communicated the resolutions to all countries which had not been represented, and nearly all the replies which have been received are favorable. Maps in exact accordance with the resolutions are, it is understood, being produced by France, Hungary, Italy, Spain, the United States, and other countries, and so far as we are concerned, by the General Staff, the Ordnance Survey, and India. These maps will be shown at the International Geographical Congress which meets at Rome in October next.

I have now come to the end of this rapid sketch of the geographical work of the official world. It is work which, though often of an apparently humdrum character, outweighs in importance the sum total of all which can by any possibility be undertaken by private agency or by societies. But it is the very legitimate business of societies to criticize and encourage.

It is, in fact, not only our manifest duty to encourage the systematic mapping of the world on which we live, but we should do all we can to ensure the perfection, and suitability for their special purposes, of the maps themselves. In the surveying of the earth's surface and its representation by means of maps we are treating of matters which are essentially and peculiarly our own.

It would appear that another great function of Geography, as represented by Geographical societies and congresses, is to serve as a popularizing medium for such sciences as geodesy, geology, climatology, and anthropology, and also to serve as the means of bringing

together the workers in these sciences. We may be told that so far as this Association is concerned the exact study of geodesy and meteorology is dealt with by Section A, geology by Section C, and anthropology by Section H, but there is, I believe, no other section which forms a more convenient general meeting-ground for all the workers in the various divisions of earth-knowledge. We ourselves have our own special work, work which is shared by no others, the great task of mapping the world. This task is such a necessary one, and it is of such genuine value to so many studies, that by assisting in it we are really furthering the Advancement of Science, which is the object of this great Association.

FOUNDATIONS OF ECONOMIC PROGRESS IN TROPICAL AFRICA*

BY

CYRUS C. ADAMS

Thirty-five years ago, we knew practically nothing of tropical Africa, more than ten or twelve miles inland, excepting along a few great rivers and the other routes of pioneer explorers. European traders had few direct relations with the east coast. The western shores were more easily accessible and here were many white men at their stations near the river mouths, engaged in a thriving barter trade. But they did not go inland. Sierra Leone has been a crown colony of the United Kingdom for more than a century, but, twenty-five years ago, its Hinterland was geographically unknown.† European enterprise was content to hug the coast though much trade came to it from the interior. Catholic missionaries at Gaboon and Landana, when asked why they did not extend their work into the interior, said they had no resources for traveling inland.‡ On the broad estuary of the Congo it was thought phenomenal if traders ever ventured as far as the Yellala Falls, some

* Read at Clark University in the Conference upon "The Near East and Africa," October, 1910. Reprinted from *The Journal of Race Development*, Clark University, vol. 2, no. 1, July, 1911.

† "A Transformed Colony." Sierra Leone as it was and as it is, etc. By T. J. Alldridge. J. B. Lippincott Company, Philadelphia, 1910. p. 17.

‡ *La Revue Congolaise*, vol. 1, no. 2, 1910, Brussels. p. 179.

ninety-five miles from the mouth of the river. Trading stations were sometimes attacked and many were kept on a war-footing.

The modern transformation began in 1879 when Stanley was sent by the African International Association, with King Leopold at its head, to make a practical study of the Congo plateau, above the 235 miles of cataracts, for purposes of possession and exploitation. In the following year, Brazza ascended the Ogowe River, making treaties with the chiefs and starting the foundation of the French Congo. This was the initiation of the partition of tropical Africa among the colonial powers of Europe. To this appropriation of the greater part of the second largest continent was given some semblance of formality by over 2,000 treaties to which the marks of as many important chiefs were affixed.

Each of five densely peopled and prosperous countries of Europe eagerly sought all it could get of these new lands.* Each wanted colonies (1) as sources of supply of foodstuffs and of raw materials for the industrial enterprises of the mother land; (2) as reliable, oversea markets for home manufactures; (3) as possible, ultimate areas of settlement for superfluity of the home population. We know to-day that, in the first two respects, the acquirement of tropical African colonies by European powers will be a most profitable investment; and that the third ambition, to secure lands where many of the home people may begin life anew under the flag of their fathers, will be realized to a small extent.

The evidence is now ample to justify these great enterprises in Africa. Germany has observed that the total export and import trade of her once decried colony of German East Africa with about 10,000,000 population amounted, in 1908, to \$10,000,000; and that in the same year, the value of her total trade relations with China, with over 300,000,000 population, was also \$10,000,000. We may safely say that, on the whole, the desirable results, both material and humanitarian, of this mighty colonial movement, in the first thirty years of its existence, have far surpassed expectations; that tropical Africa seems destined permanently to contribute far more to the wealth of the world than, in our ignorance, we dared to expect; that the good in African peoples which Livingstone claimed for them, exists and is being developed; and that the vast white spaces on the maps of a generation ago, are found to be filled with potentialities that will give wide influence, a great future to tropical Africa.

The seven colonial powers in tropical Africa finally found them-

* Belgium, France, Germany, Great Britain, Italy.

selves in possession of about 7,088,000 square miles of territory, an area more than twice as large as that of the United States. Scarcely a square mile had been surveyed. There were no maps to give intelligent direction to effort. Almost nothing was known of the climatic variations over this vast expanse, of the hydrographic régime, of the distribution of forests, grazing lands, minerals and other resources. Could the whites so far master problems of tropical hygiene that they might sojourn there in a fair state of strength? Would the natives work for them? Hundreds of questions such as these were constantly arising and they had to be answered. There could be little economic development unless they were answered. The attempt will be made here to show some of the facilities which the whites are providing for their work, the partial solution of their problems, and the material progress now manifest as the result of long experience and study.

Exploration, in detail, has made wonderful progress, but its completion, in so vast an area, will require many future decades. By the collaboration of many hundreds of officials and specially detailed or independent observers, a good working knowledge, however, has been obtained of large and very numerous districts which are most conveniently situated for early development. Some of these districts embrace the most of whole colonies or protectorates as Togo, Sierra Leone, and French West Africa; but we should add that in each of these districts there may be large areas, of forests, for example, that have not yet been explored.

These studies, on the whole, cover the ground that should always be covered by those who come after the pioneer explorer; in other words, a large proportion of the published results are the work of expert investigators, put in the field by governments, societies, or companies who require reliable data. The topics treated embrace all phases of tropical Africa that are of special interest now, in the work of development, including tropical hygiene. A considerable number of monographs and books which embody the essence of all that has been learned in one or another field of study are constantly appearing. As an illustration, we may cite the Austrian botanist, Franz Thonner, who has published a work of 673 pages and 150 plates describing all the species of flowering plants that are now known in Africa and its islands. Of course, the great variety and the volume of carefully collected information, now in print, is invaluable for the manifold enterprises under development.

It may be very trite to say that "Maps are a short cut to geographical knowledge;" but, in our country, where there is little gen-

eral appreciation of the great helpfulness of good maps, the idea seems to require iteration. The leaders in the movement to transform tropical Africa realized that it would be worth all it might cost to produce good maps of the new possessions. The result is that, for more than a quarter of a century there has been incessant pushing of surveys and map-making; so that, to-day, we may get a good idea, from maps, of the distribution of the natural and cultural features of tropical Africa including, on many maps of fairly large scale, a great deal of detailed information. Of course, these maps are not all of equal value; many of them are based merely upon reconnaissance surveys; but, fortunately, so many astronomical points have now been fixed throughout tropical Africa that it is very often convenient to tie to them surveys of all kinds for map-making purposes. Most of the frontiers of the African colonies have now been surveyed and delimited, which is very helpful to other mapping, because they supply so many fixed points of latitude and longitude.

The many scores of survey parties, whether for boundary or other purposes, have contributed very largely to our knowledge because many of them were explicitly instructed carefully to collect and record all the information they could gather about the geography, the rock formations, the vegetation, the peoples, resources, etc., of the countries through which they passed. The German report on the joint British-German survey for the delimitation of the boundary between Victoria Nyanza and Kilimanjaro was a delight to those who appreciate definite, reliable information about new lands. The governor-general of the vast French Congo declared a year ago, that the reports on itinerary surveys were too summary to be of the highest usefulness in completing the map of the colony; and he issued an order that survey parties should collect and coördinate series of facts relating to geology, hydrology, meteorology, ethnography, botany, statistics, etc., all of which, as he said, are of prime importance in the development of the French Congo.

This supplementary idea has been added to most of the schemes of map-making. Hundreds of map sheets, therefore, give a good, general idea of the nature of the economic development for which each region mapped seems best adapted. These maps, accordingly, are of prime importance in the shaping of new enterprises.

The many maps which the French have produced in the Sahara are topographical itineraries, with astronomical points fixed so that there has been large rectification of positions assigned by the earlier explorers to oases, wells, settlements and routes. Trigonometrical

surveys have also been made of important oases. Some grazing areas and cultivable lands have been discovered and outlined in the middle and south of the Sahara. Few military expeditions have been richer in geographical results than that which the French have recently led against the warrior class who preyed upon the pastoral people of Mauritania. A map was constructed of the whole area traversed, so that another white space in Africa has been filled with map detail. The British have shown in Kordofan that, though the best maps must be based upon triangulation, still a map may be made that is most useful and informing, though not strictly accurate from a cartographic standpoint.

In a concise reference to the mapping of tropical Africa, which is of great importance in development work, only a few of the most conspicuous features can be mentioned. Dr. Gruner has said of the fine ten-sheet map of Togo, on a scale of 1:2,000,000, or 3.1 statute miles to an inch, that even on this comparatively large scale it was impossible to show all the accurate topographic detail collected. This map was in preparation for about ten years; and, as in all the German maps based upon detailed surveys, accurately determined data are carefully differentiated from less exact information, by the color scheme and other devices.

The Togo map and the other German maps of large parts of German East and Southwest Africa and the Cameroons are among the very best products of the kind that have ever been made in new lands. They give an incomparably more accurate idea of the regions they represent than we could possibly derive from any map of the western part of the Balkan Peninsula, published thirty years ago. The official German Colonial Atlas, printed in 1897, is so completely out of date, that new sheets are being issued embracing the large amount of cartographic material now available.

The French map product also maintains a high standard. The sheets, in colors, of the colonies, on which the Colonial Office has generalized the enormous amount of survey material collected, are among the best maps of recently explored parts of the world. Both the British and French governments are also issuing map sheets on a scale of 1:1,000,000, containing the results of the latest information on the areas covered.

Comparatively little new map work has been done in the Portuguese and Spanish territories; and it must suffice here merely to refer to the very serviceable cartographic output of the Belgian Congo and other colonies. The present status of map work has made possible, within the past few years, the production of good

economic maps showing climatic and topographic variations, the distribution of great forests, swamps, dry areas, plains, highlands, minerals and other export products, the extent of navigation, etc. All these maps are preliminary and incomplete, but they represent the great progress in our knowledge of Africa; and about 100 new map sheets are issued every year to supplement and improve them. Though Africa is the last of the continents to be opened to enterprise, this great event has occurred in an era that in many ways, and not least in the production of good maps, is facilitating more rapid development than was possible in any other of the continents.

As in surveys and map-making, so also in railroad construction and telegraph installation, tropical Africa, in the space of twenty-five years, has far surpassed the record of any other new land in the same length of time. The impossibility of developing the colonies without bringing the great interior areas of production into close relations with the sea by means of railroads was recognized from the first; and a large amount of government and private capital has been invested in these enterprises. Some of them, most notably the Congo Railroad, in the lower cataract region, have, from the first, paid all charges and substantial dividends. Most of them have paid all working expenses and a part of the interest on their obligations. Their record, in these initial days of colonial production, is of splendid augury for their future success.

Reference can be made here only to some of the more important rail routes. The Cape to Cairo Railroad has advanced from Cape Town across the Zambesi at Victoria Falls to Broken Hill, the present terminus of the main line. A branch line to the northwest is now in operation to the copper field of Katanga (Belgian Congo), so that there is continuous rail connection from Cape Town over 2,100 miles north. The northern section is now completed to Senaar, on the Blue Nile. On the way south, it will circumvent the swamp region of the White Nile. The whole line (Cape to Cairo) will be about 6,870 miles long and about three-fourths of the distance is now covered by steam routes, rail or river.

The Belgian Railroad Company of the Great Lakes is just completing its rail routes around the cataracts and rapids of the Upper Congo, so that there will now be uninterrupted steam transportation by water or land, for about 2,250 miles from the mouth of the river to Kalengwe Falls, the extreme limit of navigation. A railroad is to be built from these Falls to southern Katanga. This mining region will therefore have steam connections with the sea, both at Cape Town, at the mouth of the Congo and at Beira, in Portuguese

East Africa. Some progress has also been made in the construction of the railroad which will ultimately connect Benguela, the Angola seaport on the Atlantic with the mineral region of south Katanga.

The foreign trade of the Nyasaland Protectorate has been hampered by the fact that the Shire River is impassable for most craft during the dry months, (April-December). This impediment has now been obviated by a railroad in operation between Port Herald and Blantyre, the capital of the Protectorate.

Speke was about a year and Stanley eight months in reaching Victoria Nyanza from the Indian Ocean. A governor of German East Africa has now left his capital at Dar es Salaam, traveled by steamer to Mombasa, thence by the Uganda Railroad to Victoria Nyanza, then by steamer around the entire coast, stopping at every German station and in Uganda, and back to his capital, about a month after he left it.

The upper and middle Niger is now connected at three points with the sea by steam transportation. The French are running trains from Kayes, the head of navigation, on the Senegal River, to Bamako on the Niger, connecting with the little steamers for Timbuktu, on the edge of the Sahara; so that the time from Timbuktu to France, if close connections are made, is nineteen days. The Senegal, however, in the dry season is not navigable. The French are therefore constructing a railroad from Dakar, their leading port in Senegal, to Kayes, in order to secure uninterrupted steam service between the Atlantic and Timbuktu. The same government has completed a railroad across its colony of French Guinea from Konaakry, the chief port, to Kurussa on the Upper Niger, and have thus two steam routes to that river. The third railroad to the Niger, further south, is a British enterprise, now in operation between Lagos and Jebba, with results so remarkable that if the figures for the last three months, of 1910, correspond with those of the previous nine months, the receipts for that year will be about \$500,000 over and above the operating expenses. It will take some time to bridge the Niger at Jebba, but the railroad is advancing rapidly beyond the river and it will be completed in less than three years to Kano, the leading commercial center of the Central Sudan, and will pass through the great cotton area of Northern Nigeria; with a branch running to Bauchi, now said to be one of the greatest future sources of the world's tin supply.

The native labor question involves perplexities, but it is moving towards solution. Nearly all of tropical Africa is for the blacks, not for white colonists. The natives themselves must supply the manual

labor which development requires. The whites will direct the important enterprises, but unless the native furnishes the brawn and sinew, the work will not be done. So the colonial policies have long been formulating around the idea that the negro is essential to prosperity, an indispensable constituent in the agencies of wealth production and that all efforts to build up thriving colonies without him will fail.

The labor question has been much obscured by writers who have drawn sweeping deductions from what they have seen in very limited areas. Many natives are not yet willing to work longer than is necessary to procure the few things they wish to buy. Some West African merchants, one day, thought they would stimulate rubber production by offering a higher price for it. To their surprise, the supply fell off. The natives found that at the higher price, they could satisfy their immediate wants by sending less rubber to market. Many such instances have been used to fortify the idea that the native African will not work unless you flog him to his task. This is an untenable proposition. The British know it and their laws rigidly forbid any form of enforced native labor in their African territory. The Germans have learned it and the early proposal to establish forced labor in German East Africa has never been carried out. There are many tribes such as the Wakikuyu, of the British East Africa highlands, who are, persistently, hard workers. A little familiarity with the idea that hard work will bring more comfort has turned tens of thousands of natives to habits of industry. When the Congo enterprise began, Stanley could not induce the natives to work for him. He sent to Zanzibar and to Liberia for labor. But before the railroad was built around the Congo cataracts, 40,000 of these Congo men were in the portage service. About 4,000 of the Congolese have long been at work building the stretches of railroad around sections of the upper river rapids. They have not only graded the roadbed and laid the rails, but they have also burned lime and made brick and built the stations along the new route; for one of the prominent purposes of the whole colonial régime in tropical Africa is to give industrial education to many natives so that they may better help themselves and render more effective service to the whites. Both governments and missionary societies are enlisted in this work and nowhere with better results than in the Belgian Congo, where these trained blacks are not only locomotive firemen but engineers as well; where they partly man the government printing office and have become good carpenters, cabinet makers and masons; and native tailoresses make garments

on sewing machines for the thousands of black police, soldiery and workmen.

The Handbook of the Nyasaland Protectorate says that native labor is plentiful, except in the rainy season, when the people are busy on their farmlands, and will work freely for the whites only at higher wages. In some of the colonies the natives are developing an ambition to till land for the profit they can make from the sale of their products. In 1908, the tribes near Victoria Nyanza sold for export over the Uganda Railroad, 1412 tons of grain, 1207 tons of potatoes and pineapples, and 359 tons of beans; and their sales in each line of farm products are increasing every year by hundreds of tons. We may cite another still more striking instance from the Gold Coast, West Africa. Only a few years ago, cacao was experimentally raised in the Botanical Gardens, and eighty pounds were exported, the first export from that colony of the commodity that gives us chocolate and cocoa. In 1907, the exports were 21,000,000 pounds and every pound was the product of native agriculture. The feeling is now strong that in British West Africa, as far as agriculture is concerned, the best line of development will be in the encouragement and training of the native farmer.

It may be long before the average native attains his best efficiency as farmer or wage earner, but the tendency, on the whole, is towards improvement. The main fact is that throughout the colonies, the black man is selling to the whites a tremendous total of manual service, and more of it every year; in addition, he pays a tax to help support the government under which he lives. In his report for 1909, Mr. Swann, of the Nyasaland Protectorate, says that the native tax, in only one of his collection districts, yielded \$125,000 in that year. In some colonies, the natives complain that they are not getting sufficient return for the tax they pay. In the French Congo, the annual tax is \$1 per individual, and the Catholic missionaries say that the government is doing nothing to improve navigation or the native roads to markets and is leaving the support of schools and hospitals entirely to the missions. On the whole, however, the white governments, including the French colonies, are carrying out wisely devised plans for native education, elementary of course, and particularly strong along industrial lines.

Such unspeakable outrages upon the natives as those in the Abir and one or two other rubber concessions in the Belgian Congo, are a thing of the past. To the concessionary companies was given, stupidly or wickedly, not only the exploitation of rubber in the fields assigned to them, but also absolute control over the black population

in the conceded territories, regardless of the laws of the Congo State, which, if enforced, were ample for native protection. We have heard of the remarkable fortunes of the little island of São Thomé in the Gulf of Guinea, 31 miles long and 19 miles wide, whose cacao exports, in ten years, have amounted to \$68,000,000; and that this story of the wonderful bounty of São Thomé is marred by the fact that the labor recruiting system of Portuguese Angola practically reduces the men and women who work on these island plantations to a state of slavery. We hear now that the Portuguese law of July 17, 1909, is expected to end this disgraceful condition.

We may expect soon to be able to hear over-night from Timbuktu, on the southern Saharan edge. The whole world is now in touch with the Congo, the great lakes, the Zambesi River, by telegraph. Tropical Africa is being brought nearer and nearer to the civilized nations and it is becoming more and more difficult to subject natives to a policy of systematic abuse without arousing protests that will be effective.

While tropical Africa can never become a home for millions of the white race, there are a few areas where good lands stand so high above the sea that temperate influences prevail. To these regions white immigration is already invited, to some extent, and they are destined to become the homes of many thousands of white toilers whose enterprises will include the raising of European cereals, good cattle and good breeds of sheep both for meat and wool. These lands include a large area in British East Africa where the plain gradually and steadily rises inland, as it does from Omaha to the Rocky Mountains, so that, at Nairobi, 327 miles from the port of Mombasa, the elevation is 5,450 feet above the sea, in the Kikuya country to the north and west, from 4,500 to 6,500 feet, and west of the Mau Escarpment from 6,000 to nearly 8,000 feet. On this high plateau of British East Africa, white settlers, stock-raisers and farmers have already taken up over 1,000,000 acres, much of it divided into large ranches, though there are a considerable number of small farmers. This great region adapted for white laborers includes some of the expansive game reserves where, under the law, game cannot be hunted except by special permit, which is seldom granted. The whites say, that on account of the enormous quantity of big game, they find it almost impossible to maintain fences; also that where millions of antelopes, zebras and other grazing animals can fatten on these wide grass lands, great numbers of cattle and sheep would thrive. There is a general feeling that the government should cease to extend its protection over game in immense regions that are cap-

able of development. Colonel Sir James Sadler, governor of the colony, said in a recent speech that game preservation must not be permitted to impede the development of the country by white settlers and that changes in the game laws in this particular were under consideration.

German East Africa has a fine section of these fertile highlands in the neighborhood of Mounts Kilimanjaro and Meru, where many German, Greek and other peasants are already settled and also several hundred Boers from the Transvaal. These Boers, like their fathers, are skilful and hardy pioneers. They have introduced the ox-wagon into the colony. Most of them are living on the extensive grass plains of the Meru district. The more well-to-do have covered considerable areas with maize, beans, wheat, white potatoes, fruits and vegetables and also comparatively large cattle and sheep raising. Others farm on a smaller scale with a few score of cattle and 200 or 300 sheep. Ostrich farming has begun, alfalfa is one of the new crops and beef is preserved for home consumption by drying.

Another splendid area in German East Africa for future European settlement is the high plateau of Ruanda in the northwest corner of the colony. The government has not yet organized this province.

The area which the Belgian Congo offers to white settlers comprises about 40,000,000 acres in High Katanga, between 10 degrees S. Lat. and the southern and eastern frontiers of the colony. The land is about 4,900 feet above the sea, with a mild and salubrious climate closely resembling that of Southern Rhodesia, where white settlers are constantly arriving. This area is in the highly mineralized part of Katanga, and the agricultural opportunities are probably inferior to those of the other tropical highlands; but white colonists are now moving into this region. The largest number of white settlers in any of the new colonies will probably be found, ultimately, in the southern part of German Southwest Africa, but this region is south of the southern tropic. No common man is fitted for the tremendous work of taming these wildernesses. The pioneer must have the sternest qualities, the greatest fortitude and endurance. No ordinary immigrant is accepted by the governments inviting immigration. The settler, also, while liberally assisted by government, must go provided with some means of his own.

But what of the thousands of white men who must live under intense tropical conditions, planning every phase of the material evolution of these countries and of the training of the negro for the most effective service? We may say, at least, that the terrible mor-

tality that accompanied the initiation of this work is not witnessed to-day. The great progress in the study of tropical hygiene, the abolition, for the most part, of tinned foods, the supply at most stations of fresh meat and of European vegetables, the accessibility of medical attendance, the care that is widely taken to provide the whites with spacious, well-ventilated houses, with ample shade, vegetable and flower gardens, bath houses in many cases, books and papers, and in other ways to minister to their comfort and well-being—all these influences have helped greatly to decrease the death rate; so that it is now reasonable to expect that a strong, healthy man may maintain fair health and energy for his two or three years of enlistment and that, after a good rest in a milder climate, he will return to the work with new vigor.

The material results of all this exploration, experimentation and study have been very great; and greater still, the countless lessons learned that will go very far to give the right impetus, the proper direction and the efficient method in all the future work. In view of the facts that the governmental régime had to be organized and the plant provided from the ground up, while, at the same time, a vast amount of exploration and of fundamental development work was carried on and is still in progress, it is not surprising that government expenditures still exceed the revenues; but the disparity between them is decreasing. I may here give a fact or two indicative of the trend of the commercial movement. The following import figures do not include imports for government purposes but only foreign commodities sold to the population. The export figures wholly represent colonial products sold in foreign markets.

The imports of the little Togo colony of Germany in 1898 were worth \$757,000; in 1908, \$2,127,000.

The exports of Togo, in 1898 were worth \$503,900; in 1908, \$1,703,000.

The imports of German East Africa in 1898 were worth \$4,213,000; in 1908, \$6,446,000; exports in 1898, \$1,498,000; in 1908, \$2,718,000.*

It was announced in 1899, that Uganda was just beginning to have a little foreign trade, but I have seen no statistics for that year. In 1908, the imports were worth \$1,855,000; exports \$735,000, and this in the midst of the terrible sleeping sickness.

* The total import and export trade of French West Africa doubled in the ten years ending in 1908. *Statist. du Commerce des Colonies Françaises, pour l'Année 1908, Tome premier, Paris, 1910, p. 108.* The imports of the five colonies constituting French West Africa, amounted in 1908 to \$21,718,093; exports \$18,500,189.

The imports of the six British West African colonies in 1904 were valued at \$28,690,000; in 1908, \$37,595,000. Exports in 1904, \$25,330,000; in 1908, \$35,225,000.

We may refer briefly to some other facts momentous in their bearing upon the future economic value of tropical Africa.

It may surprise many to know that European vegetables are successfully grown, especially at altitudes of 1,000 feet or more. It has taken time to learn just when to plant and how to care for them; but nearly all of our garden truck grows well in most parts of tropical Africa, even in the clearings of the Great Forest where government posts are established.*

Africa is without doubt a source of maize for European consumption. It is one of the new export crops. A shipload of it was taken from British East Africa in the fall of 1910. It is already exported in considerable quantities from the colonies north of the Gulf of Guinea.

The Handbook of Nyasaland, says that pears, peaches and possibly plums seem likely to succeed above 3,000 feet of elevation, if carefully attended.

Twelve years ago the European powers began anxiously to scan the colonial field, for regions under their flags that would supply them with cotton. There is no doubt to-day that Africa is a great future reserve for cotton. A large part of British East Africa is well adapted for this crop. In Nyasaland, American upland is a commercial success and is the variety now recommended. German East Africa, which has large areas adapted for cotton, is now importing seed from American upland grown in Nyasaland as the plant thrives better there than that from seed imported from our country. Large tracts are under cotton culture in Uganda. The natives have taken kindly to the industry, and without European supervision are preparing the land, sowing the seed, and bringing a raw material to market that for length of staple and general quality compares favorably with any cotton in the world. In 1908, four years after the first experimental efforts, the Uganda crop was sold for \$250,000. In West Africa, the cotton product of Togo, in 1909, showed an increase of 32 per cent. over the previous year. The experts who for some years have been studying the prospects of cotton in Northern Nigeria, assert that there are 24,000,000 acres in the colony which will grow the quality of fiber that Lancashire requires. If this is correct, Nigeria has three-fourths as much land adapted for cotton raising as the United States devoted to that crop in 1909.

Sisal hemp, of which Yucatan is now the greatest source of sup-

* In Commandant Delhaise's "*Les Warega*" (XX and 376 pp., Albert De Wit, Brussels, 1909), the author gives an interesting account of clearings in the great tropical forest in the eastern part of the Belgian Congo, where the soil is well adapted for the production of many crops, and European vegetables of all kinds are raised at the colonial stations.

ply, is doing so well in German East Africa that the planters complain that the facilities for shipping their fiber from the important port of Tanga, are inadequate. Wheat is growing in the highlands of Angola, British East Africa, and in Angoni Land (Nyasaland), and it is estimated that tropical Africa will produce enough wheat for all the whites living in that region. Rice in several of the West Africa colonies is declared to be fully equal if not superior to the Bengal article.

For ten years the best breeds of European cattle have been taken to Africa for the improvement of the native cattle, with the result that in some tropical regions more milk and better beef per animal is now attained; but, on the whole, the experiment has not been very successful, for the mixed breeds are quite susceptible to disease. It is so important, however, that these food resources should be in adequate supply for the whites that the experiments are continued. One of the latest phases is the importation of a breed of Zebu cattle from India, famous both for milk and meat, to cross with the native stock. Millions of sheep will be raised among the highlands of tropical Africa, for wool as well as for meat. The experiments with wool sheep on the high plateaus of British East Africa, have been most encouraging for the future of the industry.*

The study given in the past thirty years to the question of the capacity of tropical Africa, to add largely to the wealth of the world, and thereby enhance her own well-being, has conclusively proven that this vast region has enormous resources of great variety that only await exploitation; and that the tremendous outlay of brain and capital that is now and will be invested in the work of development will not be able, for generations to come, even to arrest the loss of natural wealth that cannot now be garnered. The total of essences, oils, forest growths, etc., that decay and perish every year for lack of care or collection, will long continue to exceed in amount the value of all the industrial enterprises now opening.

* A very encouraging view of the wool industry in the British East Africa Protectorate is given by Major Schlobach in the *Deutsche Kolonialzeitung*, vol. 27, July, 1920, pp. 500-2. He says that the crossing of Shropshire or Lincoln sheep from England with the South African merino has proven very successful on these highlands of British East Africa; also that sheep from Cape Colony, imported into British East Africa, are yielding heavier fleeces than in their native home.

DAYLIGHT OBSERVATIONS ON VENUS

BY

J. P. AULT

One day during the summer of 1908, while on a magnetic surveying trip in northern Canada, I was lying back in the canoe as we were sailing across one of the numerous lakes of that region, and gazing up into the brilliant blue of the sky, when suddenly I was astonished to find my attention fixed by a very bright star shining in the western heavens. Never before had I seen Venus with the unaided eye in bright sunlight, and it appeared so brilliant and so prominent that, with a little directing, it was soon located by all the members of the party.

As I had had some experience in navigation, the star's brightness and visibility at once impressed me with its possible use as an object for observation, in connection with observations on the sun, to determine the position of a ship at sea. Since that time I have been curious to know how generally it is in use by mariners and what is the accuracy of the results obtained with an ordinary sextant under the conditions that usually prevail for daylight observations at sea.

As magnetic observer and navigating officer on board the *Carnegie*, the Magnetic Survey Yacht of the Carnegie Institution of Washington, on her first cruise on the North Atlantic during 1909-1910, the opportunity came to me to try observing Venus by daylight. Observations for latitude were made on ten days at about 3 o'clock in the afternoon, with Venus on the meridian, in connection with observations on the sun for longitude. On two days observations were made at noon for longitude, in connection with observations on the sun for latitude. Also observations were usually made on two or more stars both in the morning and in the evening, so that we were able to determine very closely the accuracy of the results obtained from observations on Venus.

In observing on Venus the usual instruments and methods were employed that were used in making observations on the sun. The ordinary sun eye-piece was used in the sextant and all observations were made on the open bridge. In locating the star for the first time its approximate position with reference to the sun was found from the Nautical Almanac, and it was then very easily located with

the naked eye. Instead of "bringing the star down" to the horizon, as is usually done with the sun, the method generally employed with stars was used, namely: Hold the sextant inverted in the left hand, then direct the eye-piece toward the star, and with the right hand "bring the horizon up" to the star by moving the index arm until the star and the horizon appear in the field of view together; then clamp the index arm and taking the sextant in the right hand as usual, direct it toward the horizon where the star will appear in position for observation. Or, when observing for latitude with Venus on the meridian, the sextant may be set to the proper reading by computing the approximate meridian altitude of the star from its declination and the latitude, which is known approximately, and then by sweeping the horizon to the south or north, as the case may be, the star will be located very easily.

The observations were usually made by two and sometimes by three observers, and the results never differed by more than 0.5 of arc and usually agreed within 0.1. On one day a fourth observer, who was not experienced in the use of the sextant, measured the meridian altitude of Venus, and his result differed by only 0.7 of arc from the mean of the other results. So it is not a question of any particular skill or of any unusual atmospheric conditions, but merely requires a little patience and confidence and a normally clear atmosphere.

In the table of results is included the meteorological and other information usually noted when any astronomical observations were made. In determining the accuracy of the results obtained, the position as given by the Venus sight is compared with a mean position which depends upon observations made both before and after the Venus observations. In the case of the latitude the noon value resulting from observations on the sun is reckoned ahead to the time of the Venus sight, and the latitude resulting from observations on two or more stars in the evening is reckoned back to the time of the Venus sight, and the mean of these two reckoned results is compared with the value from Venus. On Dec. 9 this "dead-reckoning" had to be carried over a much longer interval, from star sights on the previous evening ahead to Venus, a period of twenty-two hours, and from sun observations at noon on the following day, back to Venus, a period of over twenty hours, differing by 4.0 from the Venus value. This of course cannot be compared with the other results in the last column which depend upon dead-reckoning over a much shorter interval. In the case of the longitude the result from Venus is compared with a value which is the mean of the morning

FIRST CRUISE OF THE "CARNEGIE," 1909-1910.

OBSERVATIONS FOR LATITUDE

DATE 1999.	LATITUDE NORTH.	LONGITUDE WEST.	LOCAL APPARENT TIME.	WIND. Direction Force	TEMPERATURE. Air Water	BARO- METER.	ATTACHED THER- MOMETER.	HORI- ZON.	LATITUDE RECKONED. From Noon P.M. Stars	MEAN. BY VENUS.	LATITUDE BY VENUS.	DIFFERENCE MEAN— VENUS.	REMARKS.
Dec. 9	° 06	34	15	SSE	24.0 C	29.8 C	78 F	Good	20 58.0*	21 09.4	21 06.4	(-4.0)	* Reduced from P.M. star altitudes on previous day.
14	20	25	40	NNE	24.7	30.0	76	Good	20 56.0	20 56.0	20 56.0	-1.0	22 hours earlier.
15	20	40	50	NNE	24.7	28.0	78	Good	20 04.0	20 03.4	20 03.6	-0.2	
16	20	04	48	N	27.2	28.0	80	Rolling	20 02.6	20 03.0	20 03.7	-0.5	
21	20	40	50	NW	26.2	30.21	80	Good	19 41.6	19 39.0	19 40.1	+0.3	+ Reduced from noon on following day, 20% hours later.
22	20	00	51	E	26.0	30.26	80	Good	19 57.3	19 59.9	19 59.7	-2.1	
26	21	40	41	SE	26.6	29.9	79	Rough	21 39.6	21 40.1	21 40.8	-0.7	
28	21	41	55	SE	25.2	29.7	78	Good	24 04.5	24 05.8	24 06.4	-0.5	
29	24	06	59	SSW	24.0	30.16	79	Good	23 37	23 35.8	23 36.9	+0.9	Venus in heavy clouds.
30	25	03	15	SE	23.7	30.16	79	Good	23 37	23 35.8	23 36.9	+0.9	
31	25	03	15	SE	23.7	30.16	79	Good	23 37	23 35.8	23 36.9	+0.9	
Jan. 3	28	09	14	NE	20.3	30.44	71	Good	28 09.0	28 09.0	28 09.0	0.0	
										Means	Means	0.7 0.5	Omitting first, " and second.

(* and + apply to Dec. 9 value only.)

OBSERVATIONS FOR LONGITUDE

DATE 1909.	LATITUDE NORTH.	LONGITUDE WEST.	LOCAL APPARENT TIME.	WIND.		TEMPERATURE.		BARO- METER.	ATTACHED THER- MOMETER.	HORI- ZON.	LONGITUDE RECKONED.			LONGITUDE BY VERUS.	DIFFERENCE MEAN— VERUS.
				Direction	Force	Air.	Water.				From A.M. Sun	From P.M. Sun	MEAN.		
Dec. 18	° /	° /	h m	Calm	0	29.0°C	25.0°C	inches	°			° /	° /	/	
30 01	48 02	12 00						30.47	80 F	Good	48 01.1	48 01.1	48 01.6	—0.5	
28 03	66 48	12 00	N E	2	18.8	20.0		30.46	69	Good	66 47.5	66 48.3	66 47.9	—0.6	

sun observations, reckoned ahead to noon, and of the afternoon sun observations, reckoned back to noon when the Venus observations were taken.

In the last column, omitting the first result because of the long interval over which the dead-reckoning had to be carried, the mean of the results is only 0.7 of arc, and if we omit the second result, where no stars were observed in the evening, the mean is only 0.5 of arc. When it is noted that while at sea the *Carnegie* is strictly a sailing vessel, using her auxiliary power only when becalmed, it is readily seen that the uncertainty in the steering, the difficulty in properly estimating the leeway and the effect of unknown currents, all tend to decrease the accuracy of the dead-reckoning. In view of this uncertainty the fact that the results from Venus differ in the mean from the value obtained by dead-reckoning by only from 0.5 to 0.7 of arc certainly indicates that uniformly good results can be obtained.

To the average mariner star sights appear difficult and more or less to be viewed with suspicion, but this really is due to a lack of familiarity with the operations involved, since they are no more difficult or complicated than for sun observations. The novelty of observing a star by daylight adds enough interest to the work of the navigator to warrant the undertaking of the operation without any further inducement, but there is added to this at least two opportunities for an accurate determination of the ship's position entirely independent of the operation of dead-reckoning.

It might be of interest to note the result of star observations with the sextant, using the sea horizon by moonlight. As the *Carnegie* lay at anchor off Funchal, Madeira, on Nov. 27, 1909, just one-half mile due south of a longitude station, the opportunity was taken to observe stars one night to determine the error of our chronometers. It was a bright moonlight night and the horizon was well defined. Altair was observed to the west and α Ceti to the east, and the results from the two stars differed by only 0.1 second of time. The chronometer correction obtained differed from the accumulated correction, carried ahead from Falmouth time ball observations on November 9, by only 0.2 second of time.

DEPARTMENT OF TERRESTRIAL MAGNETISM,
CARNEGIE INSTITUTION OF WASHINGTON, WASHINGTON, D. C.

STEFÁNSSON AND ANDERSON IN THE CANADIAN ARCTIC

The Society has received the following information from Mr. V. Stefánsson from the mouth of Dease River (Great Bear Lake, Canada), dated Oct. 20, 1910:

"It is now well along in the third year since we came here on what was to be a three years' undertaking at the most. We have covered the ground and done our work, though it remains to be seen if we have done it well. We have been on the Colville and Coppermine Rivers and secured the main *desideratum* of the expedition by discovering groups of people whose ancestors, and they themselves, had never seen a white man—nor an Indian for that matter. We found house-ruins here and there from Cape Lyon to Inman's River where our only predecessor, Dr. Richardson, found none; we have seen Eskimo camps scattered over the whole area between Dease River, the Coppermine River and Great Bear Lake and learned that it has been so since before the memory of anyone now living. This will, I think, surprise geographers as it completely surprised me; neither did we expect to find settlements on the mainland west of Cape Krusenstern, but we found a village of over forty houses as far west as Cape Bexley and evidences of people west beyond Point Wise. No man west of Cape Krusenstern had ever seen a white man; only one group west of the Coppermine (that at Rae River) had ever been visited by a white man, and only one man of those who saw Dr. Richardson and Dr. Rae is now living. No one had heard of Collinson's ship passing through the Straits [north of the Canadian mainland]. No one saw Amundsen's ship as it sailed west, either from the continental or the Victoria Land shore. Once, many years ago, a party that went west along the coast 'a long way,' saw a three-masted ship far out at sea. This party promptly fled inland and did not return to the coast until autumn. The ship must have been a whaler, and none of the natives were seen from it.

"Our most interesting discovery—if not the most important—was the finding of European-looking people on the south coast of Victoria Island north of Cape Bexley. I learned from Capt. Klinkenberg at Herschel Island in 1906 and from Capt. Mogg at Cape Halkett in 1908 that they had seen Eskimos near Minto Inlet who were fairer of complexion than any they had previously seen. Both captains had been commanders of the schooner *Olga* which wintered north of Prince Albert Sound in 1905-6 and again 1907-8, the only ship to visit Victoria Island since Collinson almost 60 years before. We found the group we visited (about 40 persons, of whom I saw 17) to differ strikingly from any Eskimos I have either seen or heard of. They looked more like a crew of whalers dressed in Eskimo garb than like Eskimos. This struck my native companions no less forcibly than me; one of them, who has worked aboard a whaler for more than ten years, said: 'They are not Eskimos; they are foc's'le men.'

"The finding of these Eskimos is either the beginning of the solution of one of two old problems, or else it is a new problem in the geography and ethno-

logy of the Arctic. The old problems are (a) what became of some of Franklin's men and (b) what became of the 3,000 Icelandic Scandinavians who disappeared from Greenland in the fifteenth century? But if it shall appear that the new facts have no bearing on either of these Arctic tragedies, the explanation that suggests itself is that the original Eskimo type more nearly resembled that of Europe than has been suspected and that here, in the most isolated section of the Eskimo territory, we have that type preserved in comparative purity. There remains the possibility that their environment may have caused these isolated people to vary from the parent type along a line tending towards the European, but this seems to me the least likely of all the available explanations. Whatever may be the ultimate scientific verdict, I am sure that anyone familiar with other Eskimos, and not oppressed with scientific caution, would say on seeing some of these people that they are three-quarters European. I personally have seen some forty Eskimos of various ages who are known to have European fathers, and out of the whole forty one could not pick out two that are as European in type as two of the seventeen Victoria Island men (*Ha-ner-ág-mi-üt* they call themselves) whom we visited in May last. Although their hair was no lighter than dark-brown, three had light beards (two of them would be fairly called red) and all had light eyebrows; one man had dark brown curly hair much resembling Eskimo half-bloods I have seen whose fathers were natives of the Cape Verde Islands or Portugal."

After his northern exploration in Victoria Island, Stefánsson reached the Coppermine River on June 2 last year and found the English travelers Melville and Hornby on Sept. 13 who told him of Peary's attainment of the North Pole.

"Upper Dease River, Nov. 3, 1910. This letter was begun at the winter camp of the English travelers Melville and Hornby near old Fort Confidence [on the northeast coast of Great Bear Lake] whose ruins still call to mind the old days of the Franklin Search Expeditions. These gentlemen are traveling more for pleasure than as explorers, but they have already (winter of 1908-9) penetrated into previously unvisited country northeast of Great Bear Lake and across the Coppermine to 67°45' N. This winter they will probably make one or more trips, into unknown country either to the north or east of Great Bear Lake. They have always wintered on the lake since coming north in 1908, at which time we were fellow-travelers down the Mackenzie. In the winter of 1908-9 they had headquarters on the east end of the lake just on the Arctic circle; in 1909-10 they were at the head of Bear River, and this winter just west of the mouth of Dease River. They have already supplied us with ammunition and with things we need and have offered to transport in their large boat across Great Bear Lake next summer any scientific collections we may secure this winter. It was a welcome surprise to discover their hunting camp east of the Dease in September, for they had planned to spend only two winters on Great Bear Lake and I supposed them to be already in England.

"Another unexpected neighbor is Mr. Joseph Hodgson, a retired officer of the Hudson Bay Company, who had been 'dreaming for years' of a chance to spend a winter at the mouth of the Dease and who has used his freedom from Company duties to carry out this dream. He has his whole family here and has built a comfortable house in the thick woods of the lower river valley. He has been no less kind than Messrs. Melville and Hornby in offering assistance to us. But everyone in this country lives from hand to mouth on game and fish,

so this does not mean that we have the opportunity of spending the winter in idle luxury.

"All those who live on the lake depend largely on fish, but as we have no nets we have established ourselves in a ten-acre patch of small spruce on the 'barren ground' on an easterly branch of Dease River, about thirty miles N. E. of the mouth of the main river. We would have preferred to be on the coast with the Eskimos, but unfortunately it is only too clear from the stories we have heard and the graves we have seen that famines are of frequent occurrence there in winter, and we should be more or less a burden, for I and my men are poor sealers compared with them. Besides, my people had their tussle with hunger last winter and are unwilling to take some risks which I don't much mind—they haven't the reasons that Dr. Anderson or myself have for submitting willingly to small privations.

"On parting from Dr. Anderson in March my last word was for him not to worry till Christmas (1910), but if we failed to be back by then he might undertake a 'rescue' expedition which would spoil his own plans and perhaps endanger collections he has made. For that reason I must try to reach him this fall, and I expect to start next week with one of my Eskimos (having two here) and a Bear Lake native to hunt for Anderson. I suppose him to be on Horton River about in Lat. $69^{\circ}15'$ N., Long. $123^{\circ}30'$ W., where we had our camp last winter. Going from our camp on the Dease to this point we shall be crossing one of the largest unknown areas in Canada, which is graced on the map with the mythical Rivière la Roncière and the doubtful Macfarlane, but the region is truly unknown because no explorer has been through this district. We already know that Horton River crosses and recrosses the supposed location of both these rivers between its mouth (see Franklin's map) and the charted location of Lake Granet. If we have luck we should on this trip be able to trace the main part of the course of Horton River—which is (so it seems to myself and all my Eskimos) a stream of about the size of the Coppermine and probably rises near Bear Lake.

"We are finding our lack of provisions more of a handicap than I had expected. We have used the larger part of our time these three years in making a living and have been compelled to abandon plans and forego opportunities because game was scarce, or was supposed so, in localities where useful work could have been done. A base from which one could start with loaded sleds into unknown areas would have doubled our results. Our custom of depending on the resources of the country makes gathering heavy or bulky collections practically impossible. We had to eat our entire zoological collection (caribou, wolf, fox, wolverine) in January, 1910, and that is but one of our many reverses.

"I am a little surprised that our achievements do not fall far short of predictions, for the difficulties have been greater than we thought. The rapid dwindling of the barren ground caribou has caused the largest discrepancy between our expectations and the facts—where other travelers have found their thousands we have had to make shift with dozens; the Eskimos that dressed in fawnskins a few years ago now dress in bull caribou, seal, fox and even fish skins. The only encouraging element in the situation is the gradual coming of the moose to the very outskirts of the forest area; there were none even along the west shore of Bear Lake in Richardson's time. Now they come well up Dease River and occupy the whole lake shore."

"Langton Bay, Dec. 6, 1910. [This date line shows that the explorer, after writing the letter of Nov. 3, had traveled to the northwest from Great Bear Lake at the mouth of the Dease River to the Arctic Ocean, about 250 miles.] We found last year that no 'Rivière la Roncière' reaches the ocean, nor any river corresponding to it, but that Horton River, whose mouth was first seen by Franklin's expedition, was a large river, apparently coming from a considerable distance. Last winter we followed it up from its mouth for perhaps 200 miles, measured along the bends of the river. We hoped therefore to strike it soon after leaving Great Bear Lake.

"We left the mouth of the Dease, Nov. 8, and followed the lake shore to a point ten miles east of the mouth of Fighting River. What the maps set down as a long point in Lat. $66^{\circ}55'$ N., Long. $119^{\circ}20'$ W. we found to be really a high, somewhat wooded but generally rocky island separated from the shore by a crooked channel in places not over 500 yards wide. From the point at which we left the lake our course was about west magnetic for five days, when we struck the Horton River. We followed the river through a winding course for twenty-one days and reached Langton Bay, Dec. 3. Game was scarce and we were on short allowance.

"Horton River has an average width of over fifty yards where we began to follow it, and for something like 400 miles it has an average width of over 100 yards always and generally over 200. It is swift but without bad rapids and is a stream that impresses one as larger than the Coppermine. Through the entire distance known to us till within fifty miles of the mouth there is plenty of spruce in the valley proper but hardly any on top of the banks in most places. There is but one large affluent, a stream at the juncture a little less than half the width of the main river or about 75 yards. The confluence is approximately in Lat. $69^{\circ}15'$ N., Long. $123^{\circ}15'$ West. From the confluence, Horton River flows about south true for 15 miles and thence N. W. and W. by an exceedingly crooked channel to the mouth west of the middle of the bottom of Franklin Bay (see Franklin's charts).

"I found Dr. Anderson and his four Eskimos awaiting me at Langton Bay. Last summer by a sled and boat journey of about 700 miles he reached Fort Macpherson and Herschel Island and was able to get possession of the supplies which should have reached us last year. These were carried for him by the steam whaler *Herman*, Capt. H. H. Bodfish, to Baillie Island and thence by the whaling schooner *Rosie H.*, Capt. Fritz Wolk, to Langton Bay, where they were landed the last week of August. Most fortunately for us, a whale killed by the *Rosie H.* drifted ashore near Langton Bay a few days later, so we have plenty of dog feed, and food for ourselves if necessary. Dr. Anderson and the natives had also killed about 30 caribou and six bears, and some supplies had been secured from the steamer *Herman* besides. We are therefore well off—free from anxiety about food and free to move about for the first time in years."

"Mouth of Dease River, Great Bear Lake, Jan. 21, 1911. Our return trip south across the Arctic divide proved slower and more difficult than we expected. It took thirty-three days against less than twenty as I had expected. The reason was that we attempted to haul too heavy loads—trade goods, mostly iron ware for the purchase of scientific specimens from the natives of Coronation Gulf. The snow was much deeper and softer than it had been on our northward journey in November, the weather so cold that iron sled runners grated on the snow as on sand and doubled the hauling weight of the sleds.

Securing caribou for food was difficult on account of the scarcity of the animals, and the shortness of the twilight period at noon. It was hard to find the animals, and hard to see the rifle sights for good shooting even if we did find a stray caribou. We were on short allowance, however, only for a few days. We got only three caribou but they were good sized ones. We had taken plenty of whale blubber along from Langton Bay and finally got to Great Bear Lake with ten or fifteen pounds of blubber left over—it stood both men and dogs in good stead.

"Our party was the same returning as it had been going north in November, except that Dr. Anderson accompanied us. We were finally forced to abandon 100 pounds of load, however—chiefly trade goods (about half of what we carried). Our dogs had become nothing but skin and bone and were not pulling much, so we could not have gotten the full loads across the divide about 100 miles of travel, with the barren ground of the Great Bear Lake Arctic divide about 60 miles wide. Going N. W. true from the mouth of Haldane River one reaches trees on the Horton about 55 miles from Great Bear Lake, and the barren ground on this route is about eighteen or twenty miles wide. The valley of the Horton shows outcrops of crystalline limestone practically everywhere, and in several places there are cañons of this rock up to 200 feet high.

"We start to-morrow for Coronation Gulf [over 120 miles to the N. E.] to visit the Eskimos there and to buy articles from them for an ethnological collection."

A letter from Dr. Anderson, the zoologist of the party, to the American Museum of Natural History reports that he secured a large quantity of specimens between Cape Parry and Langton Bay during the collection season of 1910.

GEOGRAPHICAL RECORD

THE AMERICAN GEOGRAPHICAL SOCIETY

TRANSCONTINENTAL EXCURSION OF 1912. The American Geographical Society of New York proposes to celebrate the sixtieth anniversary of its foundation and the completion and occupancy of its new building by an international excursion of about six weeks' duration across the United States, followed by a meeting in New York City, in the autumn of 1912. The excursion will be directed by Professor W. M. Davis of Harvard University, who hopes to have the co-operation of a number of American geographers. It will be made in a special train, including sleeping cars, a dining car and an observation car. The date of beginning will be placed as late in August as possible, in order to avoid the heat of the American summer; the date of the end must be little later than the middle of October, in order to enable European members to return home in time for university duties before the end of that month. The precise dates of beginning and ending will be determined by later correspondence and by conference with intending participants who may be present at the International Geographical Congress at Rome in October, 1911.

The number of members will necessarily be limited to fifty or sixty persons (men only), of whom it is expected that thirty or more may be European geo-

graphers. Invitations to appoint delegates whom the Society may receive as members of the excursion have lately been sent to fifteen geographical societies of Europe, in Amsterdam, Berlin, Bern, Brussels, Budapest, Christiania, Copenhagen, Lisbon, London, Madrid, Paris, Rome, St. Petersburg, Stockholm, and Vienna. After information is received as to the European membership, it is intended that invitations to take part in the excursion shall be sent to a number of American geographers.

The route of the excursion as now planned includes the following points: New York, Chicago, St. Paul-Minneapolis, Butte, Seattle (possibly San Francisco), Salt Lake City, Denver, Grand Canyon of the Colorado in northern Arizona, St. Louis, Memphis, Chattanooga, Washington, New York. The features of the landscape will necessarily be the first objects of observation in an excursion across a continent, but attention will be given to various other matters as well such as the relation of transportation lines to topographical features, problems of water supply and water power, corn and wheat on the prairies, cotton in the lower Mississippi valley, cattle ranching on the plains, various mining industries, Indian reservations in the western states, reclamation, irrigation, dry farming, forestry, etc., etc. This route will be changed should circumstances make it necessary or expedient. The monotony of overland travel by rail for forty or fifty days will be reduced by providing all possible comforts of train equipment, by frequent stops for short excursions on foot or otherwise, by occasional nights in hotels, and by abundant discussions of geographical problems.

The meeting in New York at the close of the Excursion will probably occupy two days. Foreign members of the party will be invited to make brief and informal communications on subjects that have excited their interest during the excursion, and to describe European parallels to American examples. Provision will probably be made for the subsequent publication of the papers thus submitted.

All correspondence regarding the Excursion should be addressed to Prof. W. M. Davis, director, c/o American Geographical Society, Broadway at 156th Street, New York.

NORTH AMERICA

MINERAL RESOURCES OF THE UNITED STATES. The annual report on the Mineral Resources of the United States for 1909 has only recently been published by the U. S. Geological Survey. The delay is due to the fact that, in order to ensure greater thoroughness, the statistics of mineral production in 1909 were collected under a co-operative agreement with the Bureau of the Census by means of a detailed canvass instead of by correspondence as heretofore. The report is published in two volumes, the first containing the statistics of the metals and the second the statistics of the non-metallic products of the country. A discussion of the production of metals in the United States from domestic and foreign ores, by Waldemar Lindgren, appears for the first time in these reports. A chapter on the Movement of Lake Superior Iron Ore in 1909, by John Birkinbine, accompanied by a map, is also an innovation. In the chapter on coal it is stated that revised estimates place the total original coal supply of the United States at about 3,076,000,000,000 short tons, of which only four-tenths of one per cent. had been exhausted at the close of 1909, leaving 99.6 per cent. as the apparent supply still available. Of the original supply of

anthracite, however, estimated at about 21,000,000,000 short tons, only 80 per cent. are still available. The several chapters composing the report have already been issued separately in pamphlet form and have been listed in the *Bulletin* under "Current Geographical Papers."

MR. RADFORD'S PROGRESS IN NORTHERN CANADA. Mr. Harry V. Radford, whose earlier work on his present expedition for collecting natural history specimens and geographical exploration in northern Canada has been briefly referred to in the *Bulletin* (Vol. 43, p. 134, Feb. 1911), writes to the Society from Fort Resolution, Great Slave Lake, Canada, July 9, 1911, that he and his assistant, T. George Street of Ottawa, left Fort Smith on June 27, and reached Fort Resolution by canoe on June 30. The two men intended to leave in their canoe on July 1 for Chesterfield Inlet, which they hoped to reach toward the end of September on their way to the North Coast through the Barren Grounds. A white man who had agreed to accompany them to the Arctic, deserted at Fort Resolution. He was the fourth white man to desert, and Radford and Street expected to make the trip alone. Mr. Radford adds: "It is rather a small crew for such a voyage, with many portages, rapids, etc., on the way, but I believe we can get through safely. There are no natives between Artillery Lake (Yellow Knife Indians) and Baker Lake (Eskimos), and most of the way is through the treeless Barren Grounds."

Two Indians were to accompany them in another canoe, as far as Artillery Lake, to lighten the load to that point, and help over the six or eight portages.

"We can manage to stow into our canoe only 437 pounds of food supplies, in addition to the bedding, arms, ammunition, scientific equipment, etc., that must be carried. This is hardly adequate for the two and a half months' journey to Chesterfield Inlet. I am supplying the Indians with 225 pounds additional food supplies, which are to see them to Artillery Lake and return. Street and I are depending upon securing game and fish along the way—as we carry nets and a plentiful supply of ammunition. Probably we shall have no food supplies remaining when we reach Chesterfield Inlet; but if the relief supplies requested are sent there this summer, by vessel [they were forwarded by Mr. Anthony Fiala, of the Arctic Club, through the co-operation of the Arctic Club and the Hudson Bay Company], Street and I propose to winter with the Eskimos at Baker Lake in snow houses, proceeding to the Arctic coast in the early spring. Should the supplies not arrive, it will probably be necessary for us to retreat this fall to Fort Churchill (350 miles south of Chesterfield Inlet) before the freeze-up.

"The zoological and botanical collections have been continued. All of these specimens have been forwarded to the United States Biological Survey, Washington, for determination. To date the specimens number: Mammals 67, birds 22, insects 47, plants 150, geological 10, and ethnological 40. About 400 stereoscopic photographs have been taken.

"The maps, showing results of my explorations east and west of the Slave River during the past two years, were completed during the last weeks of my residence at Fort Smith, and sent to the Interior Department of Canada. The discoveries include a large river—the Thalsen, 600 miles in length; many lakes, including Lady Grey Lake, nearly 100 miles in length; and other natural features."

SEARCHING FOR MINERAL FERTILIZERS. The *Press Bulletin* of the U. S. Geological Survey (Aug. 31, 1911) says that the field force of the Survey is carry-

ing on searches for deposits of minerals which shall furnish the three necessary elements of plant food, phosphate, nitrate and potash. The Survey has already discovered and surveyed enormous deposits of phosphate rock, and 2,398,590 acres of public land containing phosphate, withdrawn at the recommendation of the Geological Survey, are now awaiting legislation by Congress to enable their development. In order, however, to insure an "all-American" fertilizer, regardless of importations from other countries, it remains to discover deposits of nitrate of soda and potash salts. As both of these minerals are readily soluble and are not to be found as "outcrops" like ordinary rocks, the mission of the Survey is not an easy one. Nevertheless, it is believed that the geologic conditions prevailing throughout a large portion of the arid West favored the accumulation, during earlier periods of the earth's history, of both of these salts and that if these still exist in concentrated deposits it is only a question of search to discover them.

HALF A BILLION TONS OF COAL. For the first time in the history of the United States, the coal mines of the country in 1910 were credited with an output exceeding half a billion short tons, the combined production of anthracite, bituminous coal, and lignite having amounted to 501,576,895 short tons, with a spot value of \$629,529,745. This great output according to Edward W. Parker, Coal Statistician of the United States Geological Survey, was attained in spite of the fact that most of the mines in Illinois, Missouri, Kansas, Arkansas, and Oklahoma were closed for nearly six months by one of the most bitterly contested strikes in the history of the industry. The heaviest tonnage mined in any year previous to 1910 was in 1907, when a total of 480,363,424 short tons was produced.

THE ATLANTIC AND PACIFIC TRANSPORT CO. Press despatches report the organization of a steamship company which will operate lines to connect the Atlantic with the Pacific seaboard after the opening of the Panama Canal. The company was incorporated under the name of the Atlantic and Pacific Transport Co. It will bid on contracts now being advertised by the Postmaster General, which call for weekly ocean mail service between New York and Colon in six days, with stops at Charleston and Savannah; between New Orleans and Colon in four days and between San Francisco and Panama in ten days, with alternate stops at San Diego and San Pedro; and for a fortnightly service between Seattle and Panama in sixteen days, with a stop at Astoria. Although connection between the above ports is alone required the new company intends to make use of the Panama Canal and will inaugurate a continuous service between Atlantic and Pacific ports. In addition to the above lines it expects to extend its operations and have steamers sailing from Portland, Me., Boston, Philadelphia, Baltimore, Norfolk, Jacksonville, Key West, Mobile and Galveston through the canal to the Pacific Coast ports and *vice versa*. The company also expects to handle a great traffic at the Panama and Colon terminals of the canal, this trade to consist of trans-shipments to and from Central American markets and to and from the canal in connection with foreign ships from all parts of the world.

The charter of the company has been drawn up so as to conform with the requirement of the Post Office Department that the company receiving the mail contract must in no way be connected with any organization "engaged in any competitive transportation business by rail."

W. L. G. J.

CARTOGRAPHICAL

COLORING OF RELIEF MAPS. The *Geographical Journal* (Vol. 38, p. 79, 1911) says that among the Austrian workers in the direction of an improved scheme for the coloring of relief-maps, based on the optic properties of colors, Herr G. Freytag, of the Cartographical Institute of Freytag and Berndt, at Vienna, deserves credit for the results attained. Like Dr. Peucker he has been working at the question for some years, and has arrived independently at a solution, which is briefly described in a pamphlet issued by his firm this year. It is accompanied by a specimen relief-map colored according to the scheme adopted, the effect of which is perhaps as satisfactory as any of the attempts hitherto made in the same direction. The stereoscopic effect of the colors selected is well brought out by a pair of diagrams, in the first of which a square is colored with the reds in the center, these passing outwards through yellow to green and blue; in the other the order is reversed. The former gives the appearance of being raised, the latter of being depressed, in the center. The gradations are brought about by the differences in the tints, the strength remaining the same, so that violent contrasts are avoided.

AVIATION CARTOGRAPHY. The Geographical Service of the Army of France has caused a map to be made of a region, 50 miles by 80, about Chalons, "the center of aviation," which is published in the *Annales de Géographie* for August. It is on the scale of 1:200,000, about 17 by 26 inches in size, and in six colors. Every kind of road, railway, tramway, and electric wires is indicated, as well as the contours of the land, with heights given, the forests, streams, marshes, ponds, cultivated tracts, inhabited places, stations, garages, churches, graveyards, towers, windmills, forts, and even isolated trees and places dangerous for alighting. The map is beautifully executed. It is regarded as so successful that the minister of war has ordered the preparation of similar charts of the regions about Paris, Amiens, and Mézières, for use in the army manœuvres.

GEOGRAPHICAL SOCIETIES

MAJOR LEONARD DARWIN'S SUGGESTIONS FOR THE FUTURE WORK OF THE ROYAL GEOGRAPHICAL SOCIETY. In his address to the Society on May 22 (*Geogr. Journ.*, July, 1911), the retiring President made suggestions that are worthy of more than local consideration. A few extracts from the address are given here. After alluding at some length to the fact that the great era of pioneer exploration is practically a finished chapter, Major Darwin said, among other things:

"We ought no doubt, in view of the changing conditions, to direct our efforts with more persistence than heretofore in the direction of encouraging travelers to make systematic and detailed examinations of comparatively small areas, and not merely to cover long distances with the result of doing little more than confirm the impressions of previous explorers. Their surveys should be as good as is possible in the circumstances, and the information they collect should be extensive, varied, systematic and recorded with reference to the needs of the students of science and history, as well as of the man of commerce. In short, the traveler of the future ought to be a trained topographer, or to have thoroughly prepared himself in advance for some definite class of investigation, if he wishes to win our praises. . . .

"In many directions what is now most needed is not the gathering of more

crops, but rather the tedious task of systematizing, collating and indexing what is already in hand. . . . In short our aim should be, it is suggested, with the aid of maps, to correlate and popularize all knowledge which can thus conveniently be harmonized, laying especial stress on all matters of direct importance to the human race. There are obviously certain branches of learning which are clearly within our dominion, such as geodesy, surveying, topography and cartography, and to these especial attention should be paid. But as to the territories belonging to the other sciences, it would be well if we make it clear that we have no wish to annex them, our only object being as it were to trade with them in order to utilize the goods they produce and to make them more widely known and appreciated. . . .

"As regards internal administration, the aim must be to make the Society's house a place where accurate information can readily be obtained concerning all countries, including our own, the information thus supplied being all that could be described as geographical within the most elastic meaning of the word. The acquisition of suitable maps and books should, indeed, in future only be limited by financial necessity, whilst the collection of geographical photographs should be well maintained. No pains should be spared to make our systems of indexes as perfect as possible, a subject to which, as a fact, considerable attention has recently been paid; and with such aids the staff should be in a position to give every assistance to all students wishing to utilize the vast stores of information which the premises should contain. In short, we shall want more maps, more books, more photographs, and a more convenient house to hold both them and the steadily accumulating objects of interest which we own; and if the Society continues to grow in usefulness on the lines suggested, we must look forward to the possibility of a material increase being needed in the number of the staff. Moreover, our means of keeping in touch with foreign countries should be considered from time to time, to see if they are not capable of improvement. For example, as a single possible suggestion, might it not be worth considering whether British consuls, whilst actually serving abroad, should not be allowed to join our ranks with some special advantages as regards fees?

"As to the work of exploration and investigation for which we are not directly responsible, this should, as heretofore, continue to receive our warmest encouragement and our help when possible. And as to the award of medals, which has undoubtedly had such a stimulating effect in the past, it is perhaps worth noting that the task of selecting the recipients is likely to increase in difficulty as the opportunities for startling achievements become less frequent. The geographical work of our descendants is likely, as far as we can now see, to be more often noteworthy for thoroughness than for brilliancy; and thoroughness, it may be hoped, will never be a rare quality, amongst our fellow-countrymen at all events. No alarm, therefore, should be felt if some considerable changes in the method of making our awards should be made in the course of the next few years. It will only be one of the many symptoms of the wide changes taking place in the whole field of science; changes which necessitate our efforts being constantly directed towards ensuring that the work done in the geographical world be increasingly systematic, scientific and thorough, as well as more and more calculated to be advantageous to mankind."

GEOGRAPHICAL LITERATURE AND MAPS

(INCLUDING ACCESSIONS TO THE LIBRARY)

BOOK REVIEWS AND NOTICES

(The size of books is given in inches to the nearest half inch.)

AMERICA

A Bibliography of the White Mountains. By Allen H. Bent. vii and 114 pp., illustrations and index. Published for the Appalachian Mountain Club by the Houghton Mifflin Company, Boston, 1911. 8½ x 6.

All lovers of the White Mountains will welcome this book. Its pages show that at least 285 books and pamphlets have had something to say about the White Mountains. It also records nearly 300 magazine articles, a third of which have appeared in *Appalachia*; and there are also recorded about 150 poems, fifty newspapers that had been printed in White Mountain towns, thirty-six maps, and a list of early engravings. Among the producers of literature relating to the White Mountains were Longfellow, Whittier, Hawthorne, Parkman, Thoreau and Thomas Starr King. The Appalachian Mountain Club is to be congratulated on this suggestive and helpful work. It gives the guidance to the literature of the White Mountains that has long been needed.

AFRICA

A Bibliography of Sierra Leone. With an Introductory Essay on the Origin, Character and Peoples of the Colony. By Harry Charles Lukach, M.A. 144 pp., map, appendix and index. Clarendon Press, Oxford, 1910. \$2.90. 9½ x 6.

This list of books solely devoted to Sierra Leone is practically exhaustive though doubtless many articles in the journals of learned societies and magazines are not here recorded. The "Observations of William Finch, Merchant, taken out of his large Journal!" being Finch's remembrances of his visit to that country in 1607 is printed in full because it is the most complete of the early accounts of Sierra Leone. In his introductory essay the author says: "The prosperity of Sierra Leone depends and always will depend on agriculture, and the best system of training for the people is therefore one which will teach them to extract the full value from the soil."

L'Angleterre en Afrique. Capitaine E. de Renty. 266 pp. and 9 maps. Henri Charles-Lavauzelle, Paris, 1911. 4 Fr. 9 x 5½.

The author's three volumes on "Les Chemins de Fer Coloniaux" made him well known as a careful writer. In this small book he gives the essential features of the history and development of each of the British African colonies, but the treatment is too concise to admit of a thorough exposition of the subject. The material development of each of the colonies receives most attention, but some of the most important phases of development which have occurred within the past two or three years are not indicated in the book.

ASIA

The Provinces of China. Together with a History of the First Year of H. I. M. Hsuan Tung, and An Account of the Government of China. Reprinted from "The National Review" (China) as "The National Review Annual." 1910. With a Preface by Colonel C. D. Bruce. 179 pp., illustrations and indices. The National Review Office, Shanghai, 1910. 9 x 7½.

This is really a primer of Chinese national life, far in value above the unpretentious gazetteer which at first inspection it seems to be. It is very hard to say in a general definition what China really is, and without that definite knowledge of the present it is still more difficult to forecast what China is to become. But if a comprehension of the Middle Kingdom as a whole evades inquiry the detailed study of its component provinces must bring us closer to such knowledge. On that principle this work has been compiled. It does not profess to be original. Its authors have taken the best from the standard authors, they have drawn upon all records of information with due assignment of credit. Province by province they have sketched the natural and economic geography of the empire in a way which will serve to present valuable information at the point where it is directly valuable and at the same time to guide the inquirer to sources of further information. It pretends to be no more than a handbook, but the student of Chinese affairs will find it a valuable book to have at hand.

WILLIAM CHURCHILL.

Islam in China. A Neglected Problem. By Marshall Broomhall, B.A. xx and 332 pp., maps and illustrations, appendices and index. China Inland Mission, London, 1910. 7s. 6d. 10 x 6.

China's people are so numerous small wonder we had not noticed those five or ten millions of Mohammedans among them. Yet there is a mosque in every sizable city, thirty perhaps in Peking, schools for the teaching of Arabic, mullahs who speak Arabic, Chinamen who have pilgrimaged to Mecca, and Chinamen who pray toward Mecca with sacred, if uncomprehended, Arabic words. No province is without its Moslem contingent, though in Fukien, opposite Formosa, they number but a thousand. Fairly half the total of the Empire live in the western provinces, Kansu, which marches with Mongolia and Tibet and Yunnan on the Burman border.

The western Moslem is superior physically to the other Chinamen, straighter of eye, of strong nose and beard and better color. He is a cattle man where the Chinese are agricultural. He is skilful and courageous. Doubtless from these western borders the Mohammedans first entered the country. Two immigrations are probable: in the eighth century when Persia first succumbed to Arabian expansion and again by refugees from the devastations of Jenghis Khan. But Islam in China has lost memory of both occasions and sought to ally itself with the Prophet himself by a legend widely current that sends Mohammed's maternal uncle on a mission to Canton in 581 to 601 A. D. and has him build there the Mosque of the Holy Remembrance and the Smooth Pagoda. As Mohammed was born in 570 A. D. so early a Mohammedan mission starts investigation. Astronomical considerations fairly assure us of the invention of the legend in the fourteenth century, and even of the falsifying of the date of a monument at Sianfu, supposed to be of 742.

A hundred and fifty years ago the Moslems were equal before the law to other religionists in China, treated indeed with admirable liberality, but a series

of persecutions, massacres and uprisings in the west have changed that. For the twenty years preceding 1873 Yunnan and still more Yakoob Khan's country adjoining Kansu were fairly independent Mohammedan kingdoms, recognized indeed by European powers as independent. But the risings were put down, with enormous treachery and bloodshed—it is said 10,000,000 were slaughtered—and to-day the Mohammedan is hedged about with restrictions much like those the Jew suffers in Russia. His mood, the author feels, gives unequalled opportunity for Christian propaganda. His Mohammedanism is not bigoted.

The above has been fairly dug out of the author's pages, which read heavily. The pictures of mosques and race types are very fine. MARK JEFFERSON.

Lord Curzon's Administration of India. What he promised; What he Performed. By Syed Sirdar Ali Khan. 119 pp. Times Press, Bombay, 1905. 9½ x 6½.

In the six years which have elapsed since the publication of this laudation of a recalled Viceroy of the Indian Empire there has been unrest in India amounting at times to sedition and murder. Viewed against this background of events it would verge upon the polemical if the reviewer were to seek to estimate the value of this estimate of a ruler by one of the ruled. The plan which the author has set before him is to deal topically with the twelve subjects which Lord Curzon announced in his budget speech as about to claim his attention. Their scope may be estimated from the fact that the first is the greater strategy of the northern frontier against Russia, and the last is the reform of the village schoolmaster and the village policeman. Speaking for his own opinion, but probably representative of much of the sentiment of Mohammedan India, the author finds that each of the twelve topics has been carried forward to a most successful end. Time alone can determine these things; in the meanwhile geographers will be pleased to see that some measure of appreciation has come to an administrator who at one time gave promise of adding new chapters to our knowledge of the wild parts of inner Asia. WILLIAM CHURCHILL.

The Racial Anatomy of the Philippine Islanders. Introducing New Methods of Anthropology. By Robert Bennett Bean, B.S., M.D. 236 pp., illustrations and appendix. J. B. Lippincott Company, Philadelphia, 1910. 8 x 5½.

The data from the Philippines here assembled, and particularly the method of treatment to which they have been subjected, will prove of extreme interest to anthropologists. There is rich promise that the method which Dr. Bean has worked out as lucidly as laboriously may prove to be, as with the pride natural to the discoverer he describes it, a new departure in that important science. Hitherto the results of anthropometry in establishing race type have been based upon the skull and the skeleton, the anatomy of the hard and inner parts. When dealing with the living specimen it is impracticable to take accurate measurements of his inner anatomy, it is equally inconvenient to postpone the determination until the skeleton becomes available. Dr. Bean has invented in this work a racial anatomy of the living and has founded it upon the measurement of the soft and exterior parts. The special student of such themes will find pleasure in following out the author's careful establishment of comparative values of his classification by the morphology of the ear helix and the omphalic index with the older types established upon the cephalic index and skeletal structure in

general. If his conclusions work out according to his expectation he will have performed the very great service of moving anthropometry from the museum to the field. Geographers whose highest interest is in the movements of population will observe with peculiar satisfaction that Dr. Bean's method of study has availed to discover in the Philippines, both free and in easily dissociable relations with superior race types, man of a primitive type. It is not wholly surprising. No matter what the avenue along which research has been conducted in the region of which the Philippines forms the northeastern sea wall, we find ourselves brought to the necessity of regarding this area as containing somewhere a focus at which a human species arose. Students of culture have for some time had to face this problem, and it is within the last few months that a Negrito people (the Kubu) has been found by Volz in south Sumatra on that bottom plane, once considered inconceivable, where spiritual ideas and some rude conception of divinity have not yet dawned. The most recent philological examination directed upon this region is utterly meaningless if it does not point out a clear evolution of man-speech from animal-cry. The question of Pithecanthropus, not as yet definitely settled, arose in the same terrain. It is full of grave significance that Dr. Bean enjoyed for a day the opportunity to measure and to photograph a living man of the almost chinless Cro-Magnon type, palæolithic man persisting far beyond his epoch.

WILLIAM CHURCHILL.

The Glory of the Shia World. The Tale of a Pilgrimage. Translated and Edited from a Persian Manuscript by Major P. M. Sykes, C.M.G., assisted by Khan Bahadur Ahmad din Khan. xiv and 279 pp. Macmillan & Co., Ltd., London, 1910. \$3.50. 9 x 6.

The geographical interest of this narrative is in some regards slight. The author has crowned his life by an act of piety in making the pilgrimage to Khorasan, to the tomb of the great Imam of the Shiite sect of Mohammedans. That is not a long journey from his home in Kerman, the desert land traversed is not by any means unknown. The sum of his contribution to such knowledge is the plan of the mosque and precincts of Meshed, pleasantly illuminated by his comments wherein piety and humor are mixed. Nurullah Khan, the author of the manuscript, although space was grudged his name on the title-page, is a man of the transition. His grandfather was the famous Haji Baba, who was the first of Persians to carry the fame of the Shah to England, and Nurullah naïvely expresses his conviction that his grandfather must have declined the Garter at the English court, since he did not bring it home with him. Nurullah's youth was spent in Mahmun, where his father was provincial Governor until he came to his death in a salt-bog while pursuing Baluchi marauders. Thereafter he lived with his uncle, the revenue officer of Kerman, at first as an assistant in that profitable employment and eventually as successor to the appointment upon the death of his uncle. Persian to the core, he is yet acquainted with the existence of Europe and the New World, he knows that "Atlantic is not a city," he is at pains to explain many things for the benefit of Europeans who might read his book. It is that which makes the narrative of such value, a picture of Persian life by a man who goes out of his way to make things comprehensible to such as are unfamiliar with the ways of Iran. The mere journey to Meshed occupies but a third of the volume, the value of the work will be found to lie in its intimate revelation of Persian custom. Nurullah is something more than an official, although he is proud to have so profitable an

employment. He is a poet, he concedes willingly that he stands second to Firdausi in his art. He concedes that Persia is the best of all possible lands, that Persian courtesy is the pink of all politeness, that Persian achievement is superior to all deeds elsewhere in the world. In Persia the best is represented by Kerman. This is not the sublimity of impudence, it is the sublimity of belief based upon conviction. Nurullah does not prove any of his contentions, he states his belief in happy assurance that these are self-evident facts. It results that we have a quaint medley of braggadocio and simplicity, but throughout runs a most interesting account of Persian life as seen by a Persian willing to point out its beauties to the alien. The work is veritably a storehouse of information as to Persian customs, folk-lore and opinions. Unfortunately, the storehouse is locked, the absence of an index is now inexcusable. Happily for the reader, Nurullah lives far from the capital, Kerman is for him the heart of the world, it is only through the presence of an English physician that he has been led to set forth for the foreign reader his knowledge of a Persian life still uncorrupted by external ideas.

WILLIAM CHURCHILL.

EUROPE

Kulturgeographische Wanderungen im Koblenzer Verkehrsgebiet. Von Dr. R. Martiny. pp. 189-349, map and illustrations. Forschungen zur deutschen Landes- und Volkskunde herausgegeben von Dr. Fr. G. Hahn, Neunzehnter Band, Heft 3. Verlag von J. Engelhorn's Nachf., Stuttgart, 1911. Mk. 9.50. 9 x 6½.

Dr. Martiny, following the general scheme of these books, interprets the Coblenz trade district in its cultural development, showing the natural reasons which have partly influenced the location of its towns, its industrial establishments, its railroads and other highways, vineyards, fields, forests, etc., describing also the various directions in which the cultural life of the people has developed. The book contains an excellent folded map and is a careful and minute study in anthropogeography.

Guide to Italy and Sicily. Sixth Edition. cxxviii and 394 pp., 19 maps, 36 plans and indices. Macmillan & Co., Ltd., London, 1911. \$3.25. 6½ x 4½.

The sixth edition of this useful guide book will be welcome. It is a concise and handy volume which omits no really important sights of Italy, though careful not to confuse the tourist by diverting his attention to the insignificant. The needs of all kinds of tourists are kept in view and even cyclists will find considerable matter intended especially for them. The maps and plans, of course, add much to the helpfulness of the work.

POLAR

Polar Exploration. By William S. Bruce, LL.D., F.R.S.E. 254 pp., maps and index. Henry Holt and Co., New York, 1911. \$1.75. 7 x 5.

This is not a history of Polar exploration but rather a book written for a wide public outlining the essential facts and problems of exploration in high latitudes. Dr. Bruce has had personal experience in nine Polar voyages and leadership in several of them. In this little volume he gives in a most readable manner the quintessence of his experience and observations. His topics as given in the ten chapter headings are:

Astronomical Features of the Polar Regions; The Polar Regions; Land Ice;

Sea Ice and Coloration of Ice and Snow; Plant Life; Animal Life; Physics of the Polar Seas; Meteorology; Magnetism; Aurora, and Tides; Aims and Objects of Modern Exploration.

A short quotation is given here as illustrative of the style of the book and of the interesting and edifying nature of its contents. After writing (pp. 190-1) of the Antarctic deep-sea deposits of globigerina ooze, red clay, and diatom ooze, Dr. Bruce continues:

"To the south of this belt or band of diatom ooze we have a continuous ring south of 60° S., which is a deep-sea deposit of blue mud. In the Weddell and Biscoe Seas we have a small patch in the blue mud region which seems to be a sort of mixture of blue mud and red clay, and which is associated with the area of deep water mapped out by the *Valdivia* and the *Scotia*. A special point of interest in this blue deposit is found on examining maps of deposits in different parts of the world, when it is seen that this deposit is always associated with continental lands. It occurs round the whole of the coasts of South and North America; round the coasts of Europe, Asia, and Africa. There is, in fact, no continental coast which is not bounded by blue mud. The natural inference, therefore, is that when we find blue mud surrounding an area of land about the South Pole that it is there in association with a great mass of continental land . . . The important feature to remember is the diatom ooze at the bottom of the Antarctic and subantarctic seas and the blue muds in the vicinity of all known Antarctic lands, indicating a greater extension of those lands and the existence of a great Antarctic Continent, further proof of which has already been given."

A charming and thoughtful work that will help many readers to a more intelligent appreciation of Polar exploration.

The Toll of the Arctic Seas. By Deltus M. Edwards. x and 449 pp., map and illustrations, appendix and index. Henry Holt & Company, New York, 1910. \$2.50. 8½ x 6.

Mr. Edwards has collated here a large number of thrilling or tragical incidents connected with Arctic exploration, some of which have not been hitherto published. Many of his stories were gleaned from old accounts of the explorers themselves, from obsolete reports of Army and Navy inquiries and from private journals and manuscripts. The book is interesting as a chronicle of accidents and great catastrophes, part of the price the world has paid for its present wealth of knowledge of the Arctic. The incidents are not given in chronological order and the first great Arctic tragedy involving the death of Sir Hugh Willoughby and his comrades is referred to near the end of the book.

GENERAL

Geologen-Kalender. Begründet von Geh. Rat Prof. Dr. K. Keilhack. Herausgegeben unter Mitwirkung der Deutschen Geologischen Gesellschaft. Neunter Jahrgang für die Jahre 1911-1912. Bearbeitet von Dr. W. Quitzow. Leipzig: Max Weg, 1911. 516 and 52 pp. 4 marks. 6½ x 4½.

The Geologen-Kalender is a publication for geologists similar to the Geographen-Kalender for geographers. It is issued every two years. In the current edition it has been considerably expanded. It contains a directory of

geologists (pp. 1-193); a list of the geological surveys of the world, with notes on their organization, personnel and publications, and with index maps of the geological maps of the majority of European countries (pp. 194-299); a list of university instructors of geology, mineralogy and allied sciences (pp. 299-332); a list of the geological and allied societies of the world (pp. 233-356); a note on the International Seismological Association (pp. 356-361); a note, with index map, on the International Geological Map of Europe (pp. 362-364); a list of European geological collections (pp. 364-468); besides various tables and notices of interest to the geologist. The value of this manual is illustrated by the fact that until the recent publication of U. S. G. S. *Bull.* 465, the only systematized information available concerning the state surveys of the United States, was, so far as the reviewer is aware, that to be found in the *Geologen-Kalender*.

W. L. G. J.

Wind und Wetter. Fünf Vorträge über die Grundlage und wichtigeren Aufgaben der Meteorologie. Von Prof. Dr. Leonard Weber. iv and 116 pp., illustrations and index. Verlag von B. G. Teubner, Leipzig, 1910. Mk. 1.25. 7 x 5.

Judging by the number of text-books of meteorology which have appeared in Germany during the last few years, German publishers must be very hospitably inclined towards such books. Moreover, several of these volumes have gone into second, or even third, editions, which is good evidence of the wide popular interest in the science abroad. In our own country, the situation is in both respects, unfortunately, very much less encouraging.

Dr. Weber's "Wind und Wetter," now in its second edition (the first was dated 1903), is based upon five lectures, originally delivered in a popular high school course in Kiel (1902). The book gives a clear and concise view of the larger relations of meteorology, and while it obviously cannot, within the limits of its 113 pages, go into details, the author has succeeded well in presenting his subject in an interesting and popular manner. Twenty pages are devoted to balloon and kite meteorology, and this chapter contains a few pages on the mechanics of kite flights. One of the best chapters is that on weather forecasting, from which we quote the following: "There is no absolute mathematical certainty, even in 24-hour forecasts, because of the number and the complexity of the possible combinations. Even when we use the utmost care in taking account of all the laws which hold for isobars, storm tracks and weather types; even when we read our instruments with the greatest accuracy and consult the most skilled weather prophets among shepherds and sailors, there still remains a certain part of the problem in which the art of 'weather talent' and routine, rather than exact analysis, must come into play." This is a good statement, especially for the 'general public.'

R. DEC. WARD.

L'Epoca delle Grandi Scoperte Geografiche. Seconda edizione rinnovata ed accresciuta. By Carlo Errera. xxiv and 463 pp., maps and index. Ulrico Hoepli, Milano, 1910. L. 6.50. 7½ x 5.

The second edition of this important work has been revised and somewhat enlarged. It gives a connected account of the early voyages and discoveries and of the growth of geographical knowledge from the time of the Roman Empire through the medieval era and the great discoveries of the fifteenth and sixteenth centuries down to the day of Magellan. It shows how the extension

of geographical knowledge in the Middle Ages prepared the way for the great discoveries of the Columbian era. The author estimates that less than one-twenty-fifth of the surface of the globe is now unknown. A number of plates reproduce old maps by Beatus, Fra Mauro, Juan de la Cosa, Waldseemüller, Ribero and others.

A Treatise on Electrical Theory and the Problem of the Universe.

Considered from the Physical Point of View, with Mathematical Appendices. By G. W. de Tunzelmann, B.Sc. xxxi and 654 pp., illustrations and index. J. P. Lippincott Company, Philadelphia, Pa. \$4.50. 7½ x 5½.

The fundamental aim of this extensive treatise is to show the existing state of electrical theory as far as may be without requiring of the reader further mathematical attainments than are regarded as the minimum equipment of the student of physics.

Check-List of North American Birds Prepared by a Committee of the American Ornithologists' Union. Third Edition (Revised).

430 pp., maps and index. American Ornithologists' Union, New York, 1910. 9½ x 6½.

The first Congress of the American Ornithologists' Union in 1883, appointed a Committee, to which was referred the question of a revision of the classification and nomenclature of the birds of North America. This is the third edition of the Check-List, which comprised the results of the work of the Committee. The changes in nomenclature from the second edition are numerous, owing largely to the recent great activity in bibliographical research. The provisional bird zone map illustrating the work is the fourth that has been issued.

CURRENT GEOGRAPHICAL PAPERS

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NEW MAPS

EDITED BY THE ASSISTANT EDITOR

System Followed in Listing Maps.

Title. As on original, if possible. If lacking or incomplete, necessary matter enclosed in brackets.

Scale. Natural (unless otherwise on original), followed by equivalent in miles to one inch. If no scale on original, approximate scale enclosed in brackets.

Coordinates. Approximate limiting coordinates of map given. Where map-net lacking, coordinates, if possible of determination, given in brackets. All meridians referred to Greenwich. If map not oriented N., orientation given.

Colors. Number of tints of separate symbols, not number of color printings given. Black or basal color not considered a color.

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Comment. Descriptive and Critical. In brackets.

Regional Classification. Major political divisions the unit, as a rule, except for United States and Canada. Boundaries of continents according to Siever's *Länderkunde*, Kleine Ausgabe.

MAPS ISSUED BY UNITED STATES GOVERNMENT BUREAUS

U. S. GEOLOGICAL SURVEY

ALASKA. [Maps accompanying "The Mount McKinley Region, Alaska" by A. H. Brooks, U. S. Geol. Surv. *Prof. Paper* 70, 1911:] (1) Relief Map of Central Alaska. Compiled from maps by U. S. Geol. Surv. 1:2,500,000 (1 in. = 39.46 miles). 67° - 59° N.; 151° - 141° E. 2 colors. Pl. II, facing

p. 42. [Relief in rather weak brown shading.] (a) Geologic Sketch Map of Central Alaska, with sections. 1909. 1:5,000,000 (1 in.=78.91 miles). 68° - 50° N.; 154° - 141° E. Pl. VIII, facing p. 50. (3) Geologic Map of Fairbanks District by L. M. Prindle and F. J. Katz. [1:2,300,000 approx. (1 in.=36.3 miles approx.)] Oriented N. 35° E. 65° N. and $147^{\circ}45'$ W. Pl. XVII, facing p. 180. (4) Sketch Map of Bonfield and Kantishna regions. [1:1,250,000 approx. (1 in.=19.7 miles approx.)]. 65° - 63° N.; $151^{\circ}5'$ - $147^{\circ}5'$ E. Fig. 28, p. 170. (5) Sketch Map showing distribution of timber in Mount McKinley region. [1:1,000,000 approx. (1 in.=47.3 miles approx.)]. $65^{\circ}45'$ - 61° N.; $154^{\circ}5'$ - $147^{\circ}5'$ W. Fig. 30, p. 207. [Distinguishes between timbered areas, sparsely timbered areas, areas above timber.] (6) Reconnaissance Map of Mt. McKinley region, Alaska. Surveyed 1902-06. Edition 1911. 1:525,000 (1 in.=0.88 miles). $65^{\circ}50'$ - $60^{\circ}53'$ N.; $154^{\circ}40'$ - $147^{\circ}15'$ W. 2 colors. Pl. III, in pocket. [Relief in brown contours, interval 200 ft.; drainage and glaciers in blue. Dotted lines represent probable topography, unsurveyed. The latest authoritative map of the region.] (7) Geologic Reconnaissance Map of Mount McKinley region, Alaska. By A. H. Brooks and L. M. Prindle. 1:625,000. Same coordinates as above. 21 colors. With "Key Map" showing by whom areas have been surveyed geologically, and three sections. [Geology superimposed on the preceding topographic map.] (8) Reconnaissance Map of the Ventna Mining District, Alaska. Triangulation and Topography by R. W. Porter. Surveyed in 1906. 1:250,000 (1 in.=3.95 miles). $62^{\circ}0'$ - $61^{\circ}56'$ N.; $152^{\circ}50'$ - $150^{\circ}10'$ W. 3 colors. Pl. XV, in pocket. [Relief in brown contours, interval 200 ft.]

GENERAL LAND OFFICE

ARIZONA. Territory of Arizona. Compiled from the official Records of the General Land Office and other sources under the direction of I. P. Berthrong, Chief of Drafting Division, G. L. O. 1909. 1 in.=12 miles (1:760,320). 6 colors.

[Relief in brown shading. Shows boundaries of counties, National Forests, Indian and Military Reserves, etc. Present edition of this standard map in the series of maps of public-land states issued by the Genl. Land Office.]

UTAH. State of Utah. Compiled from the official Records of the General Land Office and other sources under the direction of I. P. Berthrong, Chief of Drafting Division, G. L. O. 1908. 1 in.=12 miles (1:760,320). 6 colors.

[Same remarks apply as to the G. L. O. map of Arizona, above.]

WEATHER BUREAU

UNITED STATES. [Seven meteorologic maps of the United States, 1:20,000,000 approx. (1 in.=316 miles approx.), for April 1911, showing:] (1) Tracks of Centers of High Areas; (2) Tracks of Centers of Low Areas; (3) Departure of the Mean Temperature from the Normal; (4) Total Precipitation; (5) Percentage of Clear Sky between Sunrise and Sunset; (6) Isobars and Isotherms at sea level; Prevailing Winds; (7) Total Snowfall. 1 color. Map (6) 2 colors. Accompany, as charts 11-VIII, *Monthly Weather Review*, Vol. 39, No. 4, April, 1911.

BIOLOGICAL SURVEY

COLORADO. (a) Life Zones of Colorado. 1 in.=22 miles (1:1,393,920). 4 colors. [Fundamental bio-geographic map of Colorado. Distinguishes, after Merriam, between Upper Sonoran, Transition, Canadian, Hudsonian, Arctic-Alpine Zones.] (b) [25 maps of distribution of certain animals, mainly rodents, and 3 maps of distribution of certain trees or plants (lodgepole pine, common yucca, tree cactus) in Colorado.] [1:6,500,000 approx. (1 in.=103 miles approx.)]. Accompany, as separate plate and as Figs. 2 to 28 (excepting Figs. 15 and 20), 30, 33 and 37, "A Biological Survey of Colorado" by Merritt Cary, *North American Fauna*, No. 33, Biol. Surv., 1911.

NORTH AMERICA

UNITED STATES

CALIFORNIA. [19 outline county maps of California showing railroads and stage lines with distances between points, viz.:] Del Norte and Siskiyou; Modoc and Lassen; Shasta and Tehama; Humboldt and Trinity; Mendocino, Glenn Lake and Colusa; Butte and Plumas; Sutter, Yuba, Sierra, Nevada, Placer and El Dorado; Sonoma, Marin, Napa, Yolo and Solano; Sacramento, San Joaquin, Amador and Calaveras; San Francisco, San Mateo, Contra Costa, Alameda, Santa Clara and Santa Cruz; Stanislaus, Merced, Tuolumne and Mariposa; Madero and Fresno; King's, Tulare and Kern; Alpine, Mono and Inyo; San Benito and Monterey; San Luis Obispo; Santa Barbara and Ventura; Los Angeles and Orange; San Bernardino; Riverside, San Diego and Imperial. [Scales varying from 1:1,500,000 to 1:12,000,000 approx. (1 in.=24 to 32 miles approx.)]. Brought down to Jan. 1, 1909. Accompany, on pp. 95-115, "Mineral Productions, County Maps and Mining Laws of California," *Bull. No. 60*, California State Mining Bureau.

NEW YORK. Sketch Map of the S. E. Adirondack region showing the relation of the pre-Glacial drainage to that of the present. [1:700,000 approx. (1 in.=12.5 miles approx.)]. [$43^{\circ}50'$ - $42^{\circ}45'$ N.; $74^{\circ}20'$ - $73^{\circ}20'$ W.] Accompanies, as Fig. 1 on p. 178, paper on "Pre-Glacial Course of the Upper Hudson R." by W. J. Miller, *Bull. Geol. Soc. Amer.*, Vol. 22, pp. 177-186, 1911.

NEW YORK CITY. The New Standard Map of Greater New York. Scale 4 inches to 1 mile (1:15,840). ($40^{\circ}55'$ - $40^{\circ}30'$ N.; $74^{\circ}17.3'$ - $73^{\circ}40.0'$ W.) 15 sheets. Rand, McNally & Co., Chicago and New York. Originally published about 1903. \$30.00. [Also issued in an edition in which a separate map, usually on a reduced scale, is given to each borough or suburban district, price 50 cts. unmounted and folded in cardboard covers, or \$1.50 on heavy paper and mounted on rollers. Except in the 15-sheet edition it is kept up to date. The smaller-scale maps of the borough edition, unmounted, are best for close consultation and the larger-scale edition, on rollers, for use as a wall-map. The separate maps are:] (1) Manhattan, 4 in.=1 mile and $2\frac{1}{2}$ in.=1 mile (1:25, 344); (2) Brooklyn, 3 in.=1 mile (1:21, 120) and $2\frac{1}{2}$ in.=1 mile; (3) Bronx $3\frac{1}{2}$ in.=1 mile (1:18, 103); (4) Queens, $2\frac{1}{2}$ in.=1 mile; (5) Richmond, 3 in.=1 mile; (6) Hoboken, Jersey City and Bayonne. 3 in.=1 mile; (7) Newark, Belleville, Bloomfield, etc., 3 in.=1 mile.

The map represents conditions as they are, shows only existing streets, and thus avoids the common error in most city maps of not distinguishing between streets actually built and those projected. The map is based on original material, as maps issued by city departments, etc. It shows that neatness and clearness of line which is the sign of the skilled draftsman's work. The symbols for street-car and elevated subway lines, for example, are so well chosen that, when superimposed, they clearly convey the meaning that both a street-car and an elevated or a subway line, as the case may be, follow the same street. The map has been reproduced by a photographic process which faithfully renders the careful delineation of the original. This is a great advance over the wax-engraving process. It is essentially a black-and-white map. Color overprints have been used (as green, for parks and cemeteries), without grasping, however, the possibility which color-printing affords for a wider range of expression and greater clearness. This advantage would have been realized if, for instance, areal coloring had been used to show built-up areas. In this respect the map falls farthest short of fulfilling one of the principal requirements of an ideal city map. Representing the built-up areas in color (aside from its anthropo-geographic value) would have allowed drawing the streets in their proper width, as their names, printed in black, could then be extended beyond the street limits without impairing legibility. City blocks might also have been drawn to scale, and the fact that this was not done makes it difficult or impossible to use the map for statistical purposes.

Color-printing has been used intelligently on the $2\frac{1}{2}$ -inches-to-the-mile map of Brooklyn, on which the routes of surface-car lines have been made more salient by overprinting in red—a feature which could be introduced to advantage on other maps of the series. In spite of these criticisms, the Standard Map of Greater New York is by far the best general map of New York City we have. It is indicative of advance in the right direction.

[Distinguishes between: Igneous Rocks; Lower Paleozoic, Carboniferous (four sub-divisions), Cretaceous, Tertiary, and Sand Hills.]

OKLAHOMA. Progress Geological Map of Oklahoma. Prepared by Chas. N. Gould, Director, Oklahoma Geological Survey, 1911. [1:1,000,000 approx. (1 in.=15.8 miles approx.).] Black. Accompanies "Brief Statement of the Geological History of Oklahoma," by C. N. Gould, *Circular* No. 2, Okla. Geol. Surv., Norman, July, 1911.

WASHINGTON. Geologic Map of Blewett District. By C. E. Weaver, assisted in the field by C. R. Fetteke. [1:21,120 (1 in.= $\frac{1}{2}$ mile).] $47^{\circ}25'$ N. and $120^{\circ}40'$ W. 11 colors. With three sections. Accompanies, as Pl. I, "Geology and Ore Deposits of the Blewett Mining District," by C. E. Weaver, *Bull.* No. 6, Washington Geol. Surv., 1911.

CANADA.

ALBERTA. Topographical Sketch of a Portion of Jasper Park, Alberta. [1:182,000 approx. (1 in.=2.8 miles approx.).] Accompanies, as Fig. 6 on p. 160, report on "Coal Fields of Jasper Park," by D. B. Dowling, pp. 150-168, *Summary Report* for 1910, Geol. Surv. of Canada [Publ. No. 1170].

[Region near exit of Athabasca R. from Rocky Mts. Photograph of a relief model.]

BRITISH COLUMBIA. Sketch Map Showing Mineral Locations, Atlin Mining District, R. C. [1:800,000 approx. (1 in.=12.6 miles approx.).] $60^{\circ}10' - 50^{\circ}0' N.$; $135^{\circ}45' - 133^{\circ}0' E.$ Accompanies, as Fig. 1, facing p. 35, report on "Portions of Atlin District," by D. D. Cairnes, pp. 27-58, *Summary Report* for 1910, Geol. Surv. of Canada [Publ. No. 1170].

BRITISH COLUMBIA. Sketch Map of Portland Canal Mining District. [1:1,200,000 approx. (1 in.=16.9 miles approx.).] $56^{\circ} N.$ and $130^{\circ} W.$ 4 colors. Accompanies report on "Portland Canal District," by R. G. McConnell, pp. 59-89, *Summary Report* for 1910, Geol. Surv. of Canada [Publ. No. 1170].

BRITISH COLUMBIA. Map of Vale District and Portion of Adjacent Districts, British Columbia. Compiled and Drawn in the Lands and Works Department, Victoria, B. C. 1910. [1 in.=8 miles (1:505,880).] $53^{\circ}10' - 49^{\circ}0' N.$; $122^{\circ}10' - 117^{\circ}30' W.$ 2 colors.

[No relief. Drainage in blue. Roads and trails shown. Boundaries of land divisions in red. This map is issued at regular intervals. Its value lies in its large scale.]

CANADA. Mineral Map [of Canada]. Scale 100 miles to one inch (1:6,335,000). 4 colors. Mineral information corrected to date by the Geological Survey, Dept. of the Interior, [Ottawa], 1911.

[New edition of this standard map.]

NEW BRUNSWICK AND QUEBEC. (a) Sketch Map of Dalhousie showing the relation of the eruptive mass and its apophyses to the Devonian marine sediments. [No scale]. [$48^{\circ}0' N.$ and $66^{\circ}20' W.$]. 2 colors. (b) Sketch map of the Devonian fish locality at Migouasha [=Miguasha]. [No scale]. [$48^{\circ}5' N.$ and $66^{\circ}15' W.$]. 2 colors. (c) [Chart of] Magdalen Islands, Gulf of St. Lawrence. [1:180,000 approx. (1 in.=5.9 miles approx.).] $48^{\circ}0' - 47^{\circ}0' N.$; $62^{\circ}20' - 60^{\circ}45' W.$ [Reduction of chart published July 1888 (corrections Oct. 1908) by U. S. Hydrographic Office]. Accompany, as Plates 4 and 9, facing pp. 126 and 128, "Notes on the Geology of the Gulf of St. Lawrence" and as Plate 2, facing 136, "Observations on the Magdalen Islands" by J. M. Clarke, *New York State Museum Bull.* 149, pp. 121-133 and 134-155, 1911.

SASKATCHEWAN. Indexed Pocket Map of Saskatchewan accompanied by reference index. 22 miles=1 inch (1:11,393,920). $56^{\circ}45' - 49^{\circ} N.$; $110^{\circ} - 101^{\circ} W.$ 5 colors. Rand, McNally & Co., Chicago, 1911.

[Of the usual type of wax-engraved maps compiled from the commercial point of view. Railroads shown to date.]

SOUTH AMERICA

BRAZIL. Sketch Map of the Approximate Limestone Areas of the Interior of Bahia, Brazil. By J. C. Branner. [1:100,000 approx. (1 in.=2.6 miles approx.).] $9^{\circ} - 21^{\circ} S.$; $49^{\circ}10' - 39^{\circ}10' W.$ Accompanies, as Pl. 14, facing p. 187, paper on "Aggraded Limestone Plains of the Interior of Bahia, etc.," by J. C. Branner, *Bull. Geol. Soc. Amer.*, Vol. 22, pp. 185-206, 1911.

BRAZIL. Map to illustrate a paper on the Geography of North Eastern Bahia by J. C. Branner. 1:22,500,000, or 1 in.=31.45 miles. $8\frac{1}{2}^{\circ} - 13\frac{1}{2}^{\circ} S.$; $42^{\circ}56' - 35^{\circ}0' W.$ 1 color. Accompanies first part of paper with above title by same author, *Geogr. Journ.*, Vol. 38, pp. 139-152, 1911.

BRITISH GUIANA. British Guiana to illustrate a paper by J. A. J. de Villiers. 1:2,000,000, or 1 in. = 31.56 miles. 9° – 3° N.; 63° – 57° W. 4 colors. With inset: A reproduction of Horstman's map, reduced. Accompanies paper on "The Foundation and Development of British Guiana" by the same author. *Geogr. Journ.*, Vol. 38, pp. 8–26, 1911.
[Relief in brown shading. Shows route followed by Horstman in 1739.]

CHILE. Region Salitrera de Chile comprendida entre El Toco i Copiapó. Mapa construido en vista de recientes mensuras i completado con los trabajos topográficos de la Oficina de Limites por Jorge J. Heuvelin, 1907. 4 sheets. 1:500,000 (1 in. = 7.89 miles). 22° – 28° S.; 71° – 67° W. 6 colors. With list of "Nómina de las Compañías Salitreras."

[Valuable because of relatively large scale. Relief in brown shading, nitrate deposits (*salares*) in blue. Symbols for gold, silver and copper mines. Roads and railroads in black, telegraph lines in red.]

AFRICA

ABYSSINIA. Recent Surveys in Southern Abyssinia. 1:2,000,000, or 1 in. = 31.56 miles. 10° – 3° N.; 33° – 43° E. 4 colors. With inset "Chart of Triangulation and Latitude and Azimuth Traverses", 1:50,000,000, and Table of Positions. Accompanies "A Journey in Southern Abyssinia" by C. W. Gwynn. *Geogr. Journ.*, Vol. 38, pp. 113–119, 1911.

[Relief in brown shading; drainage in blue. Valuable: embodies results of original surveys.]

BELGIAN CONGO. Chart of the River Aruwimi. From a Survey by Robt. L. Reid, 1908–10. 1:250,000, or 1 in. = 3.95 miles. $1^{\circ}50'$ – $1^{\circ}13'$ N.; $23^{\circ}35'$ – $27^{\circ}42'$ E. In three sections. 1 color. With inset map of "Part of Central Africa to serve as an index to Mr. R. L. Reid's Survey" showing position of sections, 1:150,000, or 1 in. = 7.89 miles. 3° N.– 3° S.; 23° – $33^{\circ}5'$ E. 1 color. Accompanies "The River Aruwimi" by R. L. Reid. *Geogr. Journ.*, Vol. 38, pp. 29–34, 1911.

FRENCH SOMALI COAST. Carte de la Côte Française des Somalis et Régions Avoisinantes. Dressée par A. Meunier d'après les itinéraires parcourus par tous les principaux explorateurs, la carte italienne de la Colonie de l'Érythrée et régions adjacentes, la carte anglaise du Somaliland, les cartes marines françaises et anglaises. Service géographique et des Missions, Ministère des Colonies. (a) Feuille No. 2: Harrar. $10^{\circ}45'$ – $8^{\circ}30'$ N.; $41^{\circ}32.5'$ – $45^{\circ}5'$ E. With two insets: (1) Plan de Djibouti d'après le Service des Travaux Publics et la Carte du Service Hydrographique de la Marine. 1:200,000 (1 in. = 0.31 miles). (2) Plan d'Harrar d'après M.M. Paulitschke et Mondon-Vidalhet. 1:200,000. (b) Feuille No. 3: Addis-Ababa. $10^{\circ}30'$ – $8^{\circ}30'$ N.; $38^{\circ}48'$ – $41^{\circ}30'$ E. With inset: Plan de Addis-Ababa et de ses environs d'après les travaux les plus récents. 1:200,000 (1 in. = 1.58 miles). Both maps (a) and (b): 1:500,000 (1 in. = 7.89 miles). 4 colors.

[Relief in brown generalized contours, drainage in blue, separate symbols in green for meadow-land, forests and fields. Valuable basal map. Sheet 1 (Djibouti) completes the map.]

FRENCH WEST AFRICA. Carte de l'Afrique Occidentale Française. 2^e édition 1910. Service Géogr. des Colonies. Feuille No. 2. Tombouctou. 1:2,000,000 (1 in. = 31.56 miles). 20° – $11^{\circ}5'$ N.; $7^{\circ}40'$ W.– $4^{\circ}20'$ E. 4 colors.

[Relief in brown generalized contours, drainage in blue, routes in red. Valuable basal map. Other sheets are: Dakar, Zinder, Konakry, Bingerville-Porto Novo, Forcados.]

FRENCH WEST AFRICA. Carte du Réseau Complet des Chemins de Fer Projetés en A. [frigue] O. [occidentale] F. [française]. [1:1,300,000 approx. (1 in. = 178.3 miles approx.).] [10° – 3° N.; 10° W.– 6° E.]. Accompanies on p. 231 "L'Essor de l'Afrique Occidentale Française" [by M. Ponty], *L'Afrique Française*, Vol. 21, pp. 229–240, 1911.

GERMAN EAST AFRICA. (a) Karte des besiedelten Gebietes der Landschaft Turu. Hauptsächlich nach den Aufnahmen des Majors v. Prittwitz u. Gaffron, 1903–1905, und mit Benutzung der Aufnahmen von Dr. Baumann, Dr. Dantz, Ltn. Glauning, W. Janke, Hptm. Podlech, Hptm. Ramsay, Hptm. Seyfried, Ltn. Stadlbauer, Dr. Stuhlmann, Dr. Tornau, Oberstlt. v. Trotha, Ltn. Werther bearbeitet unter Leitung von P. Sprigade von R. Schultze. 1:100,000 (1 in. = 1.58 miles). $4^{\circ}30'$ – $5^{\circ}16.4'$ S.; $34^{\circ}42'$ – $35^{\circ}17'$ E. 4 colors. (b) Skizze von Unjangwira (Bezirk Tabora) und den Nachbarlandschaften. Nach eigenen Aufnahmen (Dez. 1909–Jan. 1910) konstruiert, gezeichnet und in den Rahmen der Karte 1:300,000 eingepasst von Major v. Prittwitz u. Gaffron. 1:300,000 (1 in. = 4.77 miles). [$5^{\circ}20'$ – $6^{\circ}20'$ S.; $33^{\circ}30'$ – 34° E.]. 1 color. With "Militärgeographische Erläuterungen" and "Tabelle der Marschstrecken". Accompany, as Karte 4, "Begleitworte zur Karte von Turu (Nr. 4)" and, as Karte 5, "Begleitworte zur Karte von Unjangwira (Nr. 5)", both by Major v. Prittwitz. *Mitt. aus den deutschen Schutzgeb.*, Vol. 24, pp. 188–192 and 182–186, 1911.

[Relief on maps (a) and (b) in approximate contours in brown. On map (a) boundaries of natural provinces in red. Map (a) is an original map of the usual excellence of German colonial maps published in the *Mitteilungen*. Map (b) furnishes the first authentic information about a hitherto unexplored region.]

MOROCCO. Le Port d'Agadir. [1:36,000 approx. (1 in. = 0.57 mile)]. [31° W. and 30° N.]. Accompanies on p. 265 "L'affaire d'Agadir et les négociations franco-allemandes", *L'Afrique Française*, Vol. 21, pp. 264–267, 1911.

MOROCCO. (a) Agadir und Umgebung. 1:120,000 (1 in. = 0.31 miles). (b) Tiefenverhältnisse der Bucht von Agadir. 1:100,000 (1 in. = 1.58 mile). Accompany, as text figures, "Agadir, die Hauptzugangspforte zum Sus" by M. Hübner. *Pei. Mitt.*, Vol. 57, II, pp. 111–112, 1911.

TUNIS-TRIPOLIS. The Tunis-Tripolis Frontier, as laid down by the Joint Commission of 1910. 1:250,000, or 1 in. = 78.91 miles. 35° – 30° N.; $8^{\circ}5'$ – $13^{\circ}5'$ E. Accompanies note with same title, *Geogr. Journ.*, Vol. 38, pp. 74–75, 1911.

ASIA

JAPAN. (a) Map showing Relation of Volcanic and Seismic Phenomena in West Hokkaido. [1:1,350,000 approx. (1 in. = 68.7 miles approx.).] 46° – 41° N.; 139° – 146° E. Black. (b) Map showing the Topographical Features of the Usu-san and the Vicinity. [1:160,000 approx. (1 in. = 2.5 miles approx.).] [$42^{\circ}33'$ N. and $140^{\circ}50'$ E.]. Black. [Relief in contours: above 100 meters, interval 100 meters.] (c) Topographical Map of the Northern Flank of the Usu-san, showing the Distribution of the 45 Craterlets and the Locality of the Mountain Elevation. [1:18,000 approx. (1 in. = 0.28 mile

approx.], 3 colors. [Relief in contours: interval 20 meters]. Accompany, as Figs. 1, 2 and 4, "The Usuan Eruption and Earthquake and Elevation Phenomena" by F. Omori, *Bull. Imp. Earthq. Invest. Comm.*, Vol. V, No. 1, Tokyo, June 1911.

TURKEY IN ASIA. Zweite Reise in der Asiatischen Türkei 1899 von Dr. Max Freiherrn v. Oppenheim. Blatt I: Von Balabek nach Haleb. 1:500,000 (1 in.=9.47 miles). 36° 15' - 33° 45' N.; 35° 0' - 37° 25' E. 2 colors. With two insets (enlargements of parts of the main map): (1) Reisewege zwischen Hama und Hamah. 1:300,000 (1 in.=4.73 miles). 35° 15' - 34° 35' N.; 35° 25' - 34° 45' E. 3 colors. (2) Kartenskizze der antiken Ruinenorte in der Umgegend von Balabek. 1:300,000. 34° 7' - 33° 48' N.; 35° 53' - 36° 18' E. 3 colors. Accompanies, as Taf. 11, note with similar title, *Pet. Mitt.*, Vol. 57, II, p. 81, 1911.

[Relief in brown shading, route in red.]

AUSTRALIA

AUSTRALIA. (a) Sketch Map of N. E. Australia Showing the Area with Flowing Wells and the Distribution of the Supposed Intake Beds in Queensland. 1:15,000,000, or 1 in.=236.74 miles. 140° - 32° S.; 137° - 154° E. (b) Sketch Map of the Murray and Darling Rivers showing the position of the gauging stations and the southern border of the artesian area. 1:10,000,000, or 1 in.=157.83 miles. 26° - 37° S.; 139° - 151° E. (c) The Northern Outcrop [of Blythesdale Braystone]. 1:13,000,000, or 1 in.=17.34 miles. [175° - 205° S.; 141° - 144½° E.] (d) The Jericho and Aramac Outcrops. 1:1,000,000 (1 in.=15.78 miles) [22½° S. and 145½° E.]. (e) The Series of Southern Outcrops. 1:1,000,000. [24½° - 29° S.; 146° - 149° E.]. (f) The Southeastern Outcrop. 1:1,000,000 [29° S. and 151° E.]. (g) Sketch Map of Some of the Wells in Queensland with a Diminished Flow, or which have ceased to flow. 1:12,500,000, or 1 in.=197.25 miles. 17° - 29½° S.; 137° - 151° E. (h) Geology of the Eastern Margin of the Artesian Area near Hughenden after Maitland (1878) Showing the Distribution of the Extinct Volcanic Vents in the Area of High Potential. 1:2,000,000, or 1 in.=31.56 miles. [19½° - 21½° S.; 143° - 145½° E.] (i) Map Showing the Variation in Salinity of the Queensland Well Waters. 1:15,000,000, or 1 in.=78.91 miles. 16½° - 29½° S.; 137½° - 153° E. Accompanying, as Figs. 1, 2, 3A, 3B, 3C, 3D, 5, 10 and separate plate, paper on "The Flowing Wells of Central Australia" by J. W. Gregory, *Geogr. Journ.*, Vol. 38, pp. 34-59 and 157-181, 1911.

WESTERN AUSTRALIA. The Wiluna-Kimberley Stock Route by A. W. Canning, 1906-07. 1:1,000,000, or 1 in.=15.78 miles. 18° 8' - 26° 50' S.; 120° 0' - 128° 30' E. In four sections. With inset map of Western Australia, 1:25,000,000, showing position of sections., 3 colors. Accompanies "Mr. Canning's Expeditions in Western Australia, 1906-07 and 1908-10," *Geogr. Journ.*, Vol. 38, pp. 26-29, 1911.

EUROPE

ALPS. Sketch-map of the four great "Rock-groups" of the Alps. (After Professor Steinmann.) [1:3,800,000 approx. (1 in.=60.0 miles approx.)] [48° - 45½° N.; 5½° - 14° E.] Black. Accompanies, on p. 400, paper on "The Architecture and Origin of the Alps" by James Geikie, *Scott. Geogr. Mag.*, Vol. 27, pp. 393-417, 1911.

GERMANY. Die Provinzen Posen und Westpreussen unter besonderer Berücksichtigung der Ansiedlungsgüter und Ansiedlungen, Staatsdomänen und Staatsforsten nach dem Stande vom 1. Januar 1911. 10. Auflage. Bearbeitet auf Grund amtlicher Angaben. Auf Vögels Karte des Deutschen Reiches in 1:500,000 (1 in.=7.89 miles). 54° 23' - 51° 7' N.; 15° 5' - 17° 40' E. 7 colors. Accompanies, as Taf. 1, Vol. X, *Deutsche Erde*, 1911.

GERMANY. (a) Übersichtskarte der Siedelungsverteilung im Odenwald. 1:250,000 (1 in.=3.95 miles). [49° 55' - 49° 25' N.; 8° 36' - 9° 10' E.] (b) Karte zur Siedelungsgeographie des Odenwaldes. 1:100,000 (1 in.=1.58 miles). [Same coordinates.] 8 colors. Accompany paper on "Die Ortschaften des Odenwaldes nach Lage und Gestalt" by A. Jungk, *Geogr. Mitt. aus Hessen*, VI. Heft, pp. 1-70, 1911.

GERMANY. (a) Übersicht der Höhenschichtkarte des Grossherzogthums Hessen im Massstabe von 1:25,000. 1:500,000 (1 in.=7.89 miles). 50° 54' - 49° 12' N.; 20° 50' - 9° 40' E. (b) Übersicht der veröffentlichten Messschichtenblätter [of Prussia] 1:25,000. Blatt 3. [1:1,000,000 (1 in.=15.78 miles).] 53° 0' - 49° 48' N.; 5° 0' - 14° 20' E. Accompany "Neuere Beiträge zur Landeskunde von Hessen: Kartographie und Führerliteratur" by W. Diemer, *Geogr. Mitt. aus Hessen*, VI. Heft, pp. 79-118, 1911.

[Copies of the official index maps.]

OCEANOGRAPHICAL.

ATLANTIC OCEAN. Verbreitung der atlantischen Süswasser-Aale. Mercator projection: equatorial scale 1:50,000,000. 63° N. - 0° S.; 102° W. - 37° E. 2 colors. Accompanies, as Taf. 15, paper on "Die Verbreitung der Flusssale," *Pet. Mitt.*, Vol. 57, II, pp. 71-73, 1911.

[Shows coasts along which fresh-water eels are found and their spawning grounds. Indicates isotherms of the ocean at the depth of 1,000 meters.]

MALAY ARCHIPELAGO. Linien gleicher Gezeitenphase im Ostindischen Archipel. [Compiled by] Dr. J. P. van der Stok. 2 maps: (a) M2 Tide. (b) K1 Tide. [Mercator projection: equatorial scale 1:28,000,000 approx.] 10° N. - 15° S.; 90° - 140° E. Accompany, as Taf. 24, "Elementare Theorie der Gezeiten" by J. P. van der Stok, translated by E. Herrmann, *Ann. der Hydrogr.*, Vol. 39, pp. 354-373, 1911.

RUSSIAN COASTS. [Six charts, viz.:] (a) Balaklava Bay, S. W. Coast of Crimea, Black Sea. Compiled, 1910, from surveys by the transport *Kasbek*, 1909; supplemented by recent data. 1:2100 (1 in.=0.03 mile). 44° 30' N. and 33° 36' E. Chart No. 780. (b) Gridina Bay, Karelian Coast, White Sea. 65° 58' - 66° 51½' N.; 34° 38' - 34° 53' E. Chart No. 778. (c) Pongama Bay, Karelian Coast, White Sea. 65° 26½' - 65° 18½' N.; 34° 16' - 34° 44½' E. Chart No. 771. (d) Solovetki Bay, Onega Bay, White Sea. 65° 3' - 64° 56' N.; 35° 33' - 35° 47' E. Chart No. 775. (e) Kuzov Island, Onega Bay, White Sea. 64° 59' - 64° 53' N.; 34° 50' - 35° 20' E. Chart No. 777. (Maps (b), (c), (d) and (e): Compiled 1910 from results of the special survey of the White Sea 1889 to 1909; supplemented by recent

data. 1:21,000 (1 in.=0.33 miles). (f) From Pechora Bay to Yugor Strait, Samoyedes Coast, Arctic Ocean. Compiled 1910 from the surveys of Ivanov, 1826, and of the Hydrographic Expedition to the Arctic Ocean, 1838-1904; supplemented by recent data. 1:168,000 (2.65 miles). 69° 43' - 68° 30' N.; 57° 50' - 60° 30' E. Chart No. 772. Published by the Chief Hydrographic Office, Ministry of the Marine. St. Petersburg, 1910. [In Russian.]

SIBERIAN COASTS. [Two charts:] (a) The Gulfs of Obi and Yenisei. Kara Sea. Compiled 1910 from surveys 1828-1909; supplemented by recent data. 1:1,050,000 (1 in.=16.57 miles). 75° - 66° N.; 65° - 84° E. With inset: Dickson Island, 1:168,000 (1 in.=2.65 miles). 73° 30' W.; 80° 27' E. Chart No. 763. (b) Yama Bay, Sea of Okhotsk. Compiled 1910 from surveys of the Hydrographic Expedition to the Eastern Ocean, 1908; supplemented by former and recent data. 1:192,152 (1 in.=4.61 miles). 60° 0' - 58° 30' N.; 153° 30' - 157° 0' E. Chart No. 770. Published by the Chief Hydrographic Office, Ministry of the Marine, St. Petersburg, 1910. [In Russian.]

HISTORICAL.

ITALY. (a) Leonardo da Vinci: Pianta d'Imola. (Biblioteca del R. Castello di Windsor.) (b) Pianta Topografica della Città d'Imola. [Both plans 1:4,260 approx. (1 in.=0.7 mile approx.).] Accompany, as Tav. I and II, "La Pianta d'Imola di Leonardo da Vinci," by Mario Taratola, *Boll. della Soc. Geogr. Italiana*, Vol. 12, pp. 945-967, 1911.

[Map (a), a facsimile of a MS. map by Leonardo da Vinci of the town of Imola, lying 20 miles E. S. E. of Bologna. Map (b), added for comparison, is modern, based on a plan on the scale of 1:2,670 by F. Roschi.]

NORTH AND SOUTH AMERICA. Persistence of the Idea of North America as a Group of Islands. 2 plates. Pl. I, 1502-1514. Pl. II, 1520-1622. 4 colors. Accompany, facing p. 3, "California under Spain and Mexico, 1535-1847," by I. B. Richman, 1911.

[Superimposed outlines in color of North and South America according to old maps representative of the geographic knowledge of their time.]

PACIFIC OCEAN. Routes of Galleons in the Pacific as Noted in their Log Books. [Mercator projection: equatorial scale 1:117,000,000 approx.]. Accompanies, as Chart I, facing p. 12, "California under Spain and Mexico, 1535-1847," by I. B. Richman, 1911.

[Shows individual tracks of six galleons between 1565 and 1743.]

UNITED STATES. Map of Twenty-two Spanish and American Trails and Routes Affecting California, 1694-1849. Scale 55½ miles to one inch (1:3,516,480). 51°-21° N.; 125°-103° W. Accompanies, in pocket, "California under Spain and Mexico," by I. B. Richman, 1911.

CARTOGRAPHICAL.

WORLD. Isogonenkarte in besonderer Projektion. Von Dr. H. Maurer, 3 colors. Accompanies, as Taf. 15, paper on "Neue Weltkarte zur Darstellung der Isogonen," by the same author, *Pet. Mitt.*, Vol. 57, II, pp. 91-92, 1911.

[The world drawn on a conventional projection based on the stereographic, which represents the two hemispheres as if they were two elastic balls pressed against each other. Valuable in affording a survey of the isogonal lines over the whole earth. It brings out clearly the relationship of the astronomical and magnetic poles. This is not possible on the Mercator projection, which is usually employed.]

EDUCATIONAL.

(a) Physical Map of North America. 104 miles=1 inch (1:6,589,440). 44 x 66 inches. (b) Physical Map of the United States. 53 miles=1 inch (1:3,358,080). 66 x 46 inches. Both mounted on cloth, with rollers. The Rand McNally Series of Physical Wall Maps. Rand, McNally & Co., Chicago and New York. Each \$8.

On the map of North America relief is expressed, on land, by four tints: cream for elevations under 1,000 ft., yellow for elevations of 1,000-3,250 ft., buff for 3,250-6,500 ft., and brown for those above 6,500 ft.; on sea, by three tints of blue, increasing in intensity, for depths under 650 ft., from 650 to 6,500 ft., and over 6,500 ft. On the map of the United States seven tints based on the same color scheme are used to express land relief, one each for elevations of 0-100 ft., 100-500 ft., 500-1,000 ft., 1,000-2,000 ft., 2,000-5,000 ft., 5,000-8,000 ft., and above 8,000 ft. Ocean depths are shown in the same way as on the map of North America. On both maps mountains are represented in black hachures. Rivers are in black, with a wider overprint in blue, and are accompanied by a statement of their length. On the map of North America are shown the northern limits of forest trees, of cereals, of the vine and maize and of cotton; the -30°, 0°, 30°, 60° and 80° isotherms for January, the 40°, 60° and 80° isotherms for July, together with warm and cold ocean currents in July. Both maps bear nomenclature and display a great wealth of place names.

In this last feature the misconception which underlies the preparation of these maps as to the purpose of a wall map is most evident. They show a lack of appreciation of the fact that a wall map should convey its information at a distance and must therefore be drawn according to totally different methods from those used on a map intended for close consultation. Even if it be granted that some names are desirable to guide the lecturer the uncritical sense evidenced in the inclusion of a great number of irrelevant names is, particularly in matters pedagogic, greatly to be deplored. As to the validity of the statement on the maps themselves that they are "compiled from the latest and most authentic surveys" and of that in the catalog describing them (p. 10) to the effect that in their preparation "the latest official information and results of the most recent explorations have been utilized. They tell the truth," judgment may be had by examining on the map of North America, for instance, southern Alaska where Mt. McKinley has seemingly been added as an afterthought and bears no relation to the Alaskan range ("Alaska Mts." on the wall map) of which it actually forms the culmination, or, again, the Canadian Rockies with regard to which is still retained the legend, long disproved, of the altitude of Mts. Brown and Hooker (credited with 16,000 and 15,000 ft. respectively), or on the map of the United States the obsolete delineation of the lower Salmon River.

The pressing need of adequate school maps of our continent and country and its various sections on a larger scale than, but of equal quality to the standard school wall maps published abroad, has

not been met by these maps. We must still turn to such products as Gaebler's Schulwandkarte von Nord Amerika, 1:4,500,000, physical edition, published by Georg Lang, Leipzig (probably the best physical wall map of North America because of its large scale and its efficient method of representation), or the physical wall map of Canada (Philip's Comparative Series), 1:3,000,000, published by George Philip & Son, London, or Diercke's physical wall map of the United States and Mexico, 1:3,000,000, published by George Westermann, Braunschweig, if we wish to make use of the best material available for teaching purposes.

The other maps of this series include the other continents, except Australia, and a map of the world on Mercator's projection. The above remarks are equally applicable to them.

OTHER ACCESSIONS

SEPTEMBER, 1911

AMERICA

(The size of books is given in inches to the nearest half inch.)

FAWCETT, WILLIAM and RENDLE, ALFRED BARTON. *Flora of Jamaica*. Containing Descriptions of the Flowering Plants Known from the Island. With Illustrations. Vol. 1 *Orchidaceae*. With thirty-two plates. London, the British Museum, 1910. 9 x 5½. *Gift*.

FIGUEROA, PASQUALE. Remarks on the Arbitral Sentence Pronounced by the President of the Argentine Republic on July 9, 1909, on the Boundary Question between Bolivia and Peru. Translated from the French by Fanny Bandelier. From the *Revue Générale de Droit International Public*. New York, [1911?]. 9 x 6 (pamphlet).

VOLK, ERNEST. The Archaeology of the Delaware Valley. With 2 maps, 125 plates and 26 ills. in the text. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University. Vol. V. Cambridge, Mass. The Museum, 1911. 9½ x 6½. *Gift*.

— Early Spanish Voyages to the Strait of Magellan. Translated and edited, with a Preface, Introduction and Notes by Sir Clements Markham. (Maps and ills.) London, The Hakluyt Society, 1911. 9 x 5½.

AFRICA

BOULENGER, GEORGE ALBERT. Catalogue of the Fresh-Water Fishes of Africa, in the British Museum (Natural History). Volume II. (Ill.) London, The British Museum, 1911. 11 x 7½. *Gift*.

ASIA

— Catalogue of Maps published by the Survey of India. Corrected up to the 1st of February, 1910. Published under the direction of Colonel F. B. Longe, Surveyor General. Calcutta, The Government, 1910. 14 x 11. *Gift*.

— Extracts from Narrative Reports of Officers of the Survey of India for the Season of 1908-09. Prepared under the direction of Col. F. B. Longe, Surveyor General of India. I. The Magnetic Survey of India; II. Tidal and Levelling Operations; III. Pendulum Operations; IV. Triangulation in India. Calcutta, The Government, 1911. 13 x 8. *Gift*.

AUSTRALIA

— Year-book of Australia for 1911 (Maps and illustrations). Sydney, The Year-book of Australia and Publishing Co. 1911. 8½ x 5.

EUROPE

— A Reproduction of the Tablet Erected in Bristol Cathedral (1910) to the Memory of Richard Hakluyt. Born 1522. Died 1616. London, The Hakluyt Society, 1911. 9 x 5½.

— Statistisches Jahrbuch für das Grossherzogtum Baden. Achtunddreissigster Jahrgang. 1910 und 1911. Karlsruhe, Macklot'sche Druckerei, 1911. 11 x 7½. *Gift*.

GENERAL

EDLER, FRIEDRICH. The Dutch Republic and the American Revolution. Johns Hopkins University Studies. Series XXIX. No. 2. Baltimore, The John Hopkins Press, 1911. 10 x 6.

HARTMEYER, DR. R. (Berlin). Die Ascidien der Deutschen Südpolar-Expedition, 1901-1903, von —. Mit Tafeln XLV-LVII und 14 Abbildungen im Text. Deutsche Südpolar Expedition, 1901-1903. Herausgegeben von Erich von Drygalski, Leiter der Expedition. XII. Band. Zoologie IV. Band. Heft V. Berlin, Georg Reimer, 1911. 14 x 10. *Gift from the Imperial German Foreign Office*.

[J. E. WORCESTER. Modern Atlas (8 maps) to accompany Elements of Geography, Ancient and Modern, by —. (Boston, Cummings and Hilliard) [1810?]. 9½ x 6. No front cover or title. Maps of the World and of Africa missing. *Gift from W. Churchill*.

— The American Catalog, 1908-1910. New York, *The Publishers' Weekly*, 1911. 10½ x 7.